

# COMMERCIAL CAR JOURNAL

and OPERATION & MAINTENANCE

Entered as second-class matter at the Post Office at Philadelphia, Pa., under the act of March 3, 1879

Vol. XL Philadelphia, November, 1930 No. 3

## EDITORIAL DEPARTMENT

NORMAN G. SHIDLE, Directing Editor  
GEORGE T. HOOK, Editor

MARTIN J. KOITZSCH  
Managing Editor  
A. B. CROFOOT  
New York News

JAMES W. COTTRELL  
Technical Editor  
ATHEL F. DENHAM  
Field Editor

GEOFFREY GRIER  
Art Editor

## TABLE OF CONTENTS

### FEATURE ARTICLES

Title Page Illustration .....	13
Survey Shows Shops Are Under-Equipped .....	14
Brake Tools Stop Stopping Worries .....	18
When a Body Has a Body to Repair .....	20
Do Right by Engine With Right Tools .....	22
Testers Tell Why "Juice" Goes Wrong .....	26
Welding Keeps Metal Hunks Off Junk Pile .....	28
Straighten Bent Backs With Floor Equipment .....	29
The Drill is a Shop's Jack-of-All-Trades .....	30
Slick Devices Lay Tire Troubles Flat .....	32
Precision is Keynote of Modern Service .....	34
Washing Equipment Puts "Spic and Span" in Trucks .....	37
No Shop Has Enough Hand Tools .....	38
Lathes Turn Slews of Jobs Into Profits .....	40
Hoists and Jacks Lift Weights Easily .....	42
How to Make Lubrication Work a Pleasure .....	44
Presses Help Shops Win With "Squeeze Play" .....	46
Grinders Keep Other Tools on an Edge .....	47
Shops With Compressors Give Hard Jobs the Air .....	49
Special Tools Thwart "Can't Be Done" Jobs .....	50
"Right Dress" Front Ends and Save Tires .....	54

### DEPARTMENTS

After Hours .....	16
Commercial Car Specifications .....	65
Advertisers' Index .....	136

Published Monthly by

### CHILTON CLASS JOURNAL COMPANY

Chestnut and 56th Streets, Philadelphia, U. S. A.

C. A. MUSSelman, President and General Manager

J. S. HILDRETH, Vice-Pres. and Director of Sales

W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.

A. H. VAUX JOHN A. CLEMENTS  
Secretary and Treasurer Assistant Treasurer

A. W. BROWNELL GEORGE D. ROBERTS  
Business Manager Advertising Manager

Commercial Car Journal and Operation & Maintenance

Telephone ..... Sherwood 1424, Philadelphia

### OFFICES

New York—239 W. 39th St., Phone Pennsylvania 0080  
Chicago—5 S. Wabash Ave., Phone Central 7045  
Detroit—710 Stephenson Bldg., Phone Northway 2090  
Cleveland—1140 Guardian Bldg., Phone Main 6860

Controlled by United Business Publishers, Inc., 239 W. 39th St., New York; ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSelman, Vice-President; F. C. STEVENS, Treasurer.

**SUBSCRIPTION RATES:** United States, Mexico, United States Possessions, Canada and all countries in the Postal Union—\$2.00 per year. Foreign—\$4.00 per year. Single copies 40 cents.

Make Checks, Money Orders, etc., payable to Chilton Class Journal Company

MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

# "WRENCHED BRAKES"



MESSAGE NUMBER

TWO

TO SICK FLEET OWNERS

**B**RAKES that frequently require a wrench tend to turn "fleet profits" into " fleeting profits" . . .

Repeated adjustments and early replacement of un-serviceable brake linings take fleets off the road . . . waste time, labor and money—all of which goes down in the red!

**ALLTRAFFIC Heavy Duty Brake Linings** not only relieve fleet owners of frequent adjustments, but they provide unusual service where lining must withstand severe strain and hard wear . . . **AND AT NO GREATER COST!**

In addition to our WOVEN heavy duty, ALLTRAFFIC Engineers have perfected a new type moulded lining—in a complete range of sizes for Commercial vehicles.

Now you can get ALLTRAFFIC in either woven or moulded form—for internal or external brakes.

ALLTRAFFIC has solved the braking problems of some of the largest fleet owners and bus operators in this country . . .

For complete information fill out slip below and mail to us. Let us prescribe a remedy for your braking troubles.



Manufacturers  
DURWYLLAN CO. at PATERSON, N. J.

# ALLTRAFFIC BRAKE LINING

WOVEN OR MOULDED

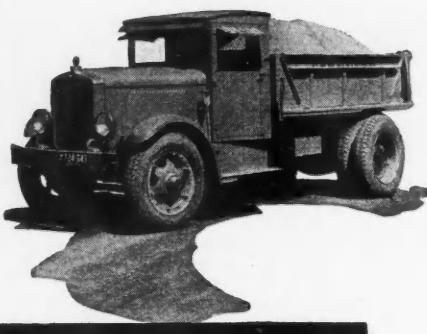
Company .....

Attn. of .....

Street .....

City .....

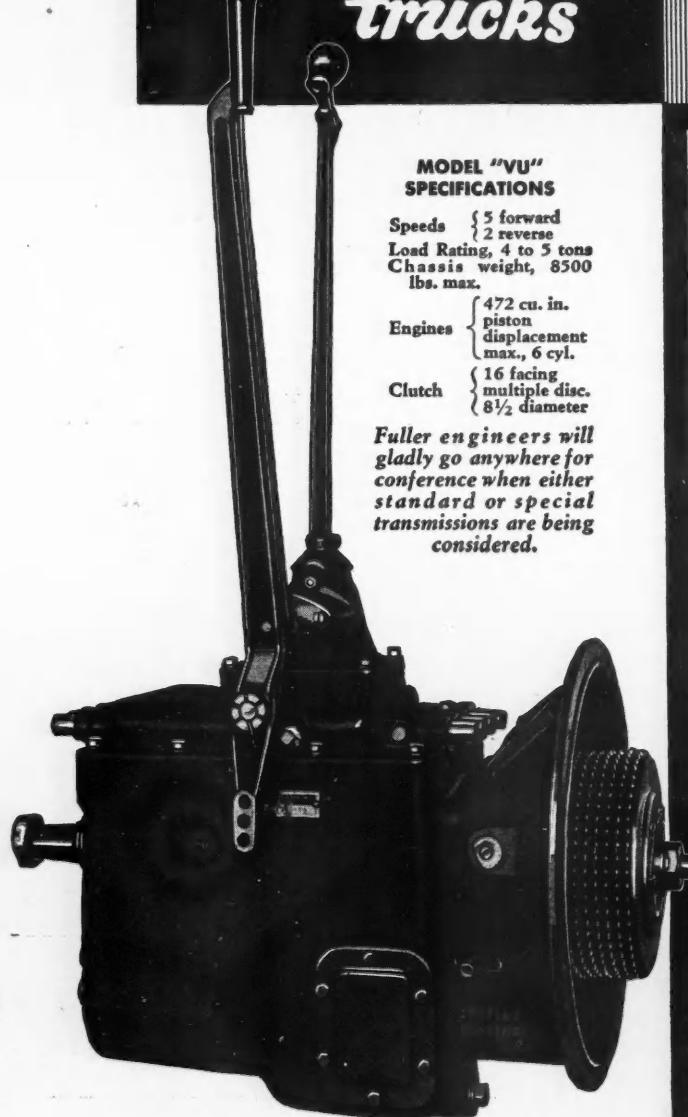
why is the  
**UNIT "VU"**  
**TRANSMISSION**  
*especially adapted  
 to short wheel-  
 base dump  
 trucks*



**MODEL "VU"**  
**SPECIFICATIONS**

Speeds	5 forward 2 reverse
Load Rating	4 to 5 tons
Chassis weight	8500 lbs. max.
Engines	472 cu. in. piston displacement max., 6 cyl.
Clutch	16 facing multiple disc. 8½ diameter

Fuller engineers will  
 gladly go anywhere for  
 conference when either  
 standard or special  
 transmissions are being  
 considered.



A SHORT WHEEL-BASE means a short propeller shaft. A short propeller shaft usually means sharp angle attachment to the transmission . . . with the angle increasing in ratio to the distance the transmission is from the motor. The only thoroughly successful short wheel-base transmission line-up is with an integral coupled unit such as the Fuller Unit "VU" Transmission. This Unit is especially adapted to dump trucks and tractors . . . because it is mounted integral with the motor and attaches directly to the bell housing, without intermediate shafting. This straightens out the propeller shaft angle, thus increasing operating efficiency and lowering maintenance costs.

This is one of many Fuller "Unit" innovations that make Fuller transmissions desirable for HEAVY DUTY SERVICE.

**FULLER & SONS MFG. COMPANY**  
 Division of Unit Corporation of America  
 Bankers Building Milwaukee, Wis.

**FULLER**  
 STANDARD AND SPECIAL  
**TRANSMISSIONS**

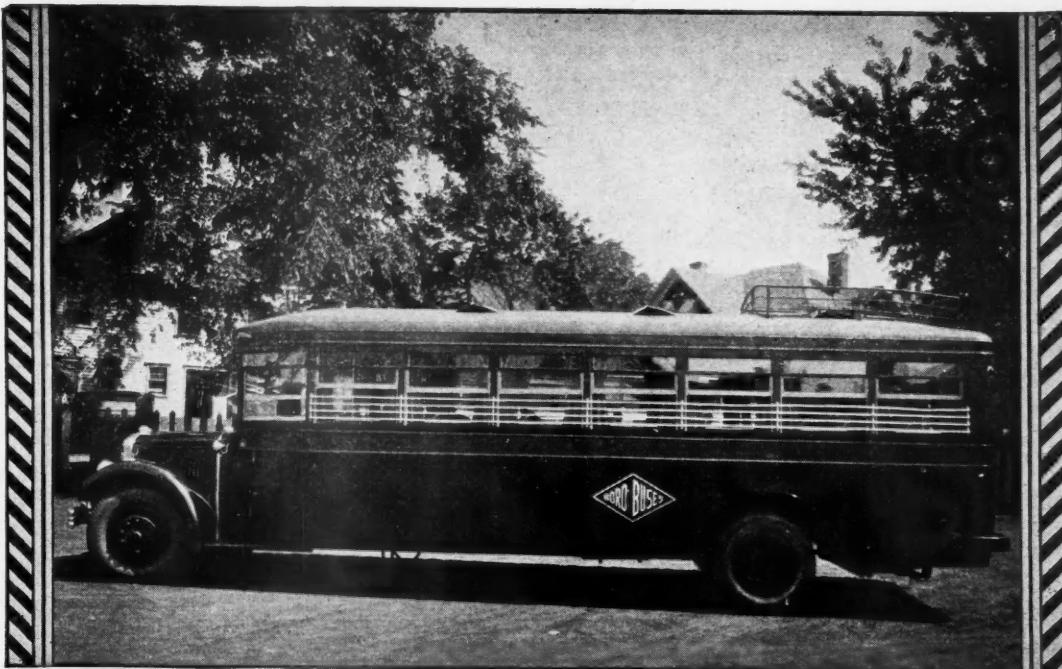
FROM ROUGH BILLET TO FINISHED PRODUCT



## DEALERS:

Robert Bosch Pyro-Action Spark Plugs will reduce operating costs . . . increase operating efficiency . . . for your customers. Recommend Robert Bosch Spark Plugs and promote your prestige!

A Fleet  
of  
21 Buses



# increases spark plug mileage..350%

THEY used to change spark plugs every 8,000 to 10,000 miles. On a fleet of 21 buses that runs into money in a year.

But two years ago the Boro Buses, Red Bank, N. J. found a spark plug that has increased plug mileage 350%. It is the Robert Bosch Pyro-Action Spark Plug. For over two years it has averaged for them from 35,000 to 40,000 miles of service.

"We absolutely would not use any other plugs," writes Mr. William Manna, Shop Superintendent. "They have never given us any trouble whatsoever."

Have you checked up lately, the

mileage your buses are getting? Why not do so today. If you are not getting long mileage from your plugs, the correct type of Robert Bosch Pyro-Action Spark Plug can save you money and reduce the risk of road breakdowns.

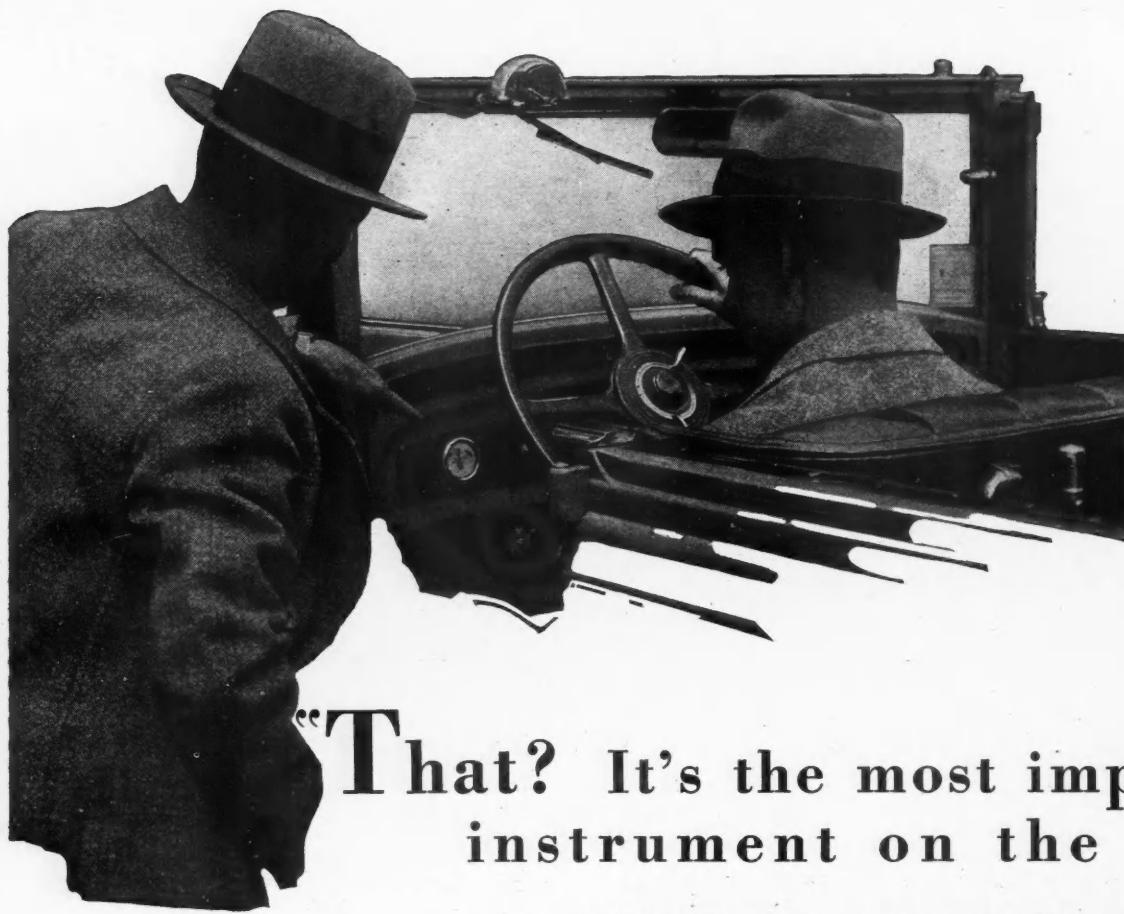
Phone your Robert Bosch service station for advice. Ask them to recommend the correct Robert Bosch Plugs for your engines. Or write us direct, specifying the types of your buses and the service conditions under which they operate.

ROBERT BOSCH MAGNETO CO., INC.  
3603F Queens Blvd., Long Island City, N.Y.



All Robert Bosch Pyro-Action Spark Plugs bear the full name "ROBERT BOSCH" and this trade mark (H) of Robert Bosch A.-G.

Famous Fleets Depend on  
**Robert Bosch Pyro-Action Spark Plugs**



## "That? It's the most important instrument on the dash"

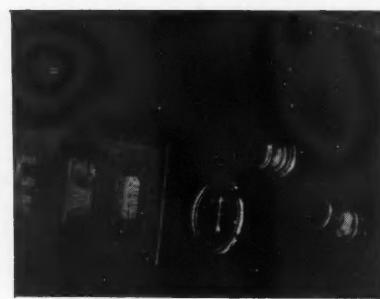
VISCO-METER is the revolutionary new device that makes proper motor lubrication simple and carefree. By giving the driver a continuous and accurate measurement of the *lubricating value* of his crankcase oil, Visco-Meter provides positive protection against the dangers of improper lubrication. It ends the wasteful guesswork of changing oil on a mileage basis.

### *Not A Pressure Gauge*

The sturdy Visco-Meter mechanism, together with its accurate dial on the dashboard, is neither a pressure gauge nor a volume indicator. Its function lies nearer the heart of lubrication than either of these devices; for

Visco-Meter measures *viscosity*, the greatest single factor in proper lubrication. At a glance the driver can see exactly the condition of the oil which is being supplied to bearings and cylinder walls. If the "body" of the lubricant is too heavy or too thin (e.g. from over-use) for safe operation, Visco-Meter reports the facts at once, and the motor is safeguarded...Visco-Meter also gives timely warning of clogged oil lines and filters, leaks, pump failures and low pressures and volumes.

**Saves Fleet Owners Real Money**  
The Visco-Meter-equipped fleet is certain to show lower operating expenses. Besides the saving in motor repair jobs thru guarded lubrication, Visco-Meter brings new economy to the oil bill...Try this new device on one of your motors! Ruggedly built, Visco-Meter never needs servicing. Easy to install. Send coupon. Visco-Meter Corporation, 316 Grote St., Buffalo, N. Y.



VISCO-METER CORP., 316 Grote Street, Buffalo, N. Y.  
Gentlemen:  
I'd like complete information on the VISCO-METER.  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
State \_\_\_\_\_

November, 1930

**The VISCO METER**  
Takes the Guesswork out



*The Commercial Car Journal*

# FEDERAL TRUCKS ARE EQUIPPED WITH LONG RADIATORS

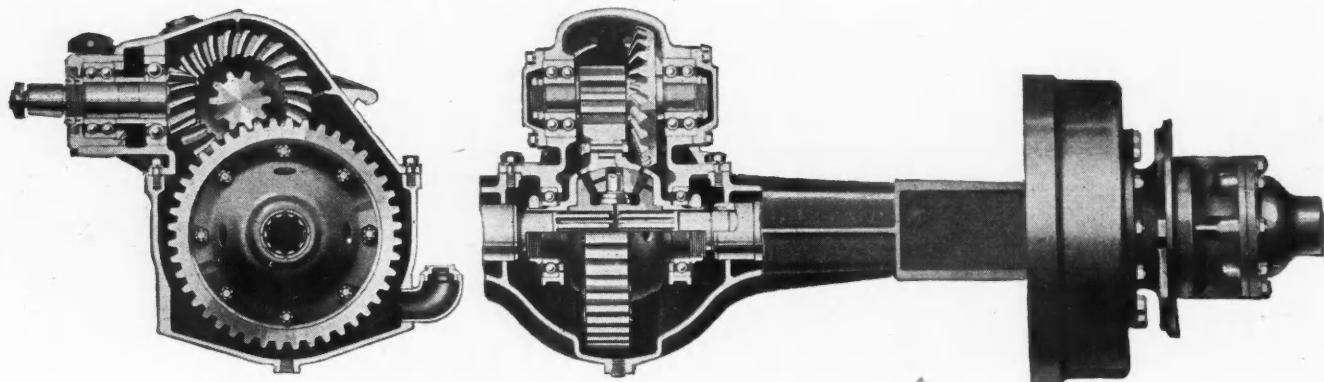


LONG PRODUCTS  
AUTOMOTIVE  
CLUTCHES AND  
RADIATORS



LONG MANUFACTURING CO., DETROIT, MICHIGAN

# Don't Pay—



## INVEST!

WHEN you buy a truck or bus, you pay for pulling power—for ability to handle maximum loads economically and without interruption.

A sensible way to get what you pay for is to specify Wisconsin Double Reduction Axles. They're an *investment*—in economical transportation.

Years of experience, accuracy of design, close limits and rigid inspection have given Wisconsin Axles their well earned reputation for low cost operation and freedom from repair bills.

**WISCONSIN AXLE COMPANY**  
OSHKOSH, WISCONSIN





## A Winning Hand for Fleet Owners

With these cards in your maintenance deck, you can duplicate original factory equipment in any Timken Bearing Equipped truck in minimum time at minimum cost.

Moreover, when you install complete new Timken Bearings—with the name "Timken" stamped on cup and cone, you won't have any come-backs, for with the restoration of Timken Bearing performance thus accomplished, the continuance of Timken service is assured.

And there's no need to tie up a dollar in stock. Your Timken Bearing stock room is just at the other end of your telephone—at the sign of the Timken Authorized Distributor. A call will bring any size of Timken Bearing you may require for any truck—immediately. The Timken Roller Bearing Service and Sales Company, Canton, Ohio.

*A nation-wide network of Authorized Distributors supported by a complete branch warehouse system.*

# TIMKEN *Tapered Roller* BEARINGS

# ANNOUNCING THE Grey-Rock



## A Complete Line for All Trucks and Buses

With this announcement of Grey-Rock Brake Blocks the Grey-Rock line of heavy duty brake linings is complete. No matter what type of brakes or under what conditions they must operate, there is a Grey-Rock Lining to meet every requirement.

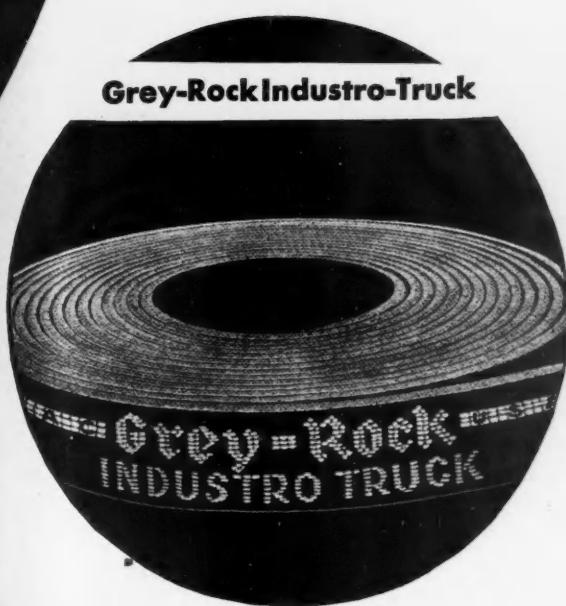
# Brake Block . . .

**Every Requirement of Every Type of Bus  
and Truck Brake is Met by This Proved  
New Lining or its Famous Running-  
Mate . . . Grey-Rock Industro-Truck**

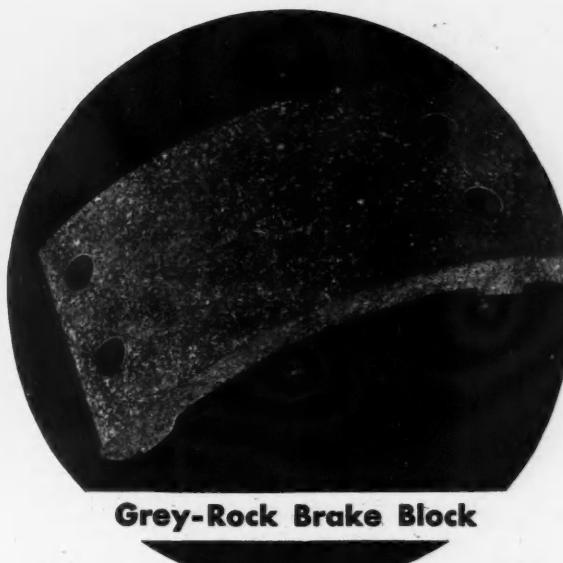
Grey-Rock Brake Blocks have been thoroughly proved by long successful service, under gruelling conditions, on several of the country's most difficult operations. This proved new lining and its famous running-mate—Grey-Rock Industro-Truck Brake Lining—meet every demand of heavy duty bus and truck service—under all possible conditions. Whatever your own particular requirements may be, one of these two linings is especially adaptable and will help to increase brake efficiency and decrease maintenance costs. Write for more complete information or to arrange for a test on your own trucks or buses.

**UNITED STATES ASBESTOS DIVISION  
of Raybestos-Manhattan, Inc. . . . Manheim, Pa.**

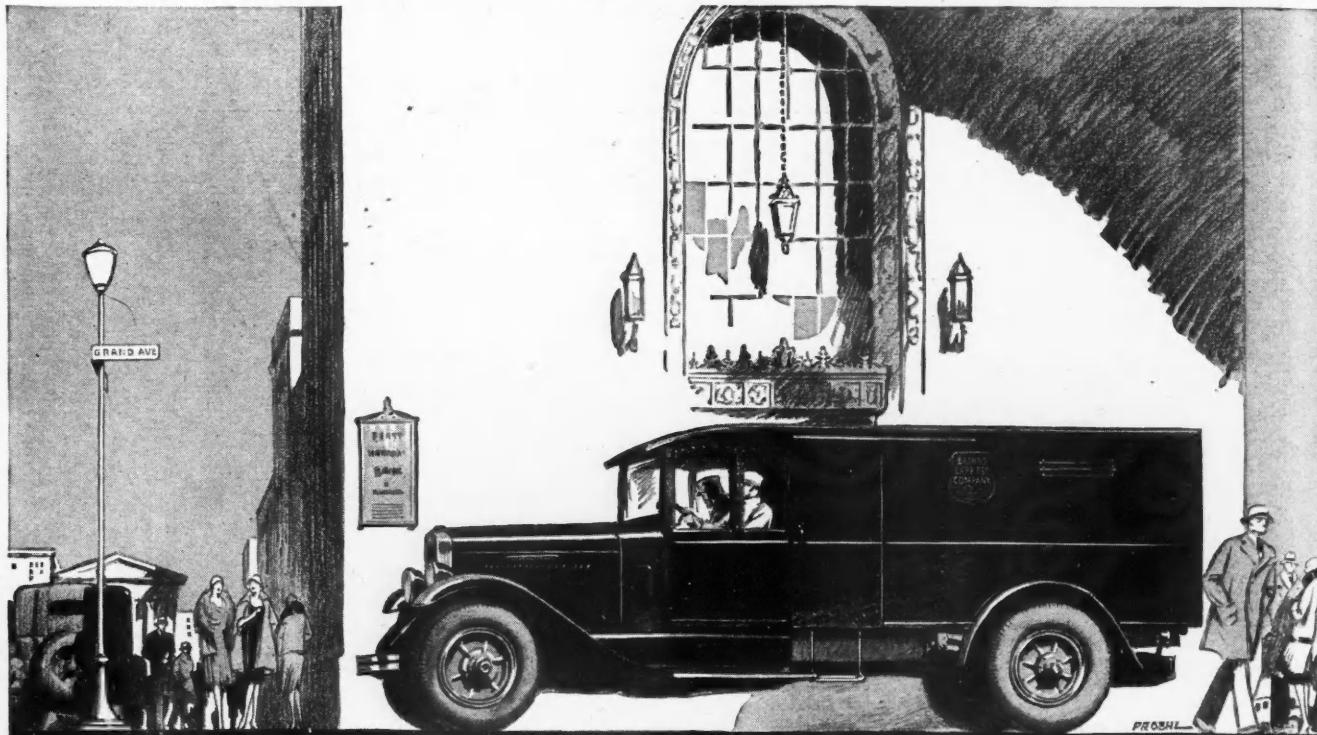
Grey-Rock Industro-Truck



Grey-Rock Brake Block



# Brink's have over 500 International Trucks in Service ...but not a Single Service Station



Brink's experience with trucks takes in many makes and many years. The result has been complete standardization on Internationals.



The complete NEW line of International Speed Trucks and Heavy-Duty Trucks is on view at Branch and Dealer Showrooms throughout the United States. Ask for a demonstration of any model at your convenience.

HERE is a mammoth transportation company that has been enabled to hold down its investment in truck-service facilities to a minimum because of the outstanding service rendered by the company from which it buys its trucks—International Harvester.

Brink's Express Company owns a fleet of over 500 Internationals. They have branches in 78 of the largest cities. Their trucks serve these and 537 other cities and towns. Yet Brink's do only the emergency servicing themselves.

The bulk of this big service job is handled by International Harvester. From routine greasing to mechanical maintenance, the work is done by trained mechanics in our 161 Company-owned Branches.

Most of the work is done at night—for

Brink's rigid schedules must not be interrupted. Brink's Express transports money—all the money in the world, you would think, for their annual volume in actual worth is nearly fifty billions of dollars.

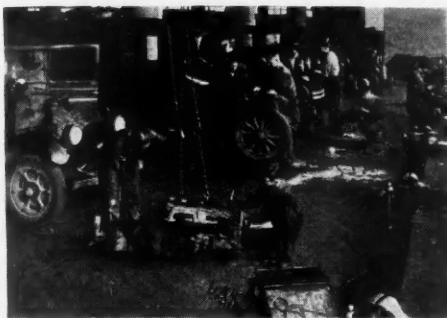
Brink's Internationals have bodies of two thicknesses of steel, and windshields of bullet-proof glass. In every mechanical detail these trucks are built to provide the surest kind of transportation. They are so serviced that they go on providing it, for International Harvester has service wherever Brink's have trucks.

It is this unique "after-sale" service that has helped to give International Trucks their fame. Every user swears by it and so will you when you put your first International to work—and your five-hundredth!

INTERNATIONAL HARVESTER COMPANY  
606 S. Michigan Ave. OF AMERICA (INCORPORATED) Chicago, Illinois

## INTERNATIONAL TRUCKS

# SURVEY SHOWS SHOPS ARE UNDER-EQUIPPED



## The Potential Shop Equipment Market for 1931 Among Trade Outlets in the Truck Industry

**\$26,000,000** worth of shop equipment is needed by the various trade sales and service outlets in the truck industry to enable them to handle with normal efficiency their present volume of repair business. This includes an item of \$3,316,800 worth of equipment which shops already normally efficient will require for expansion purposes and which new shops entering the field will require.

**\$6,115,350** worth of shop equipment is needed for purely replacement purposes.

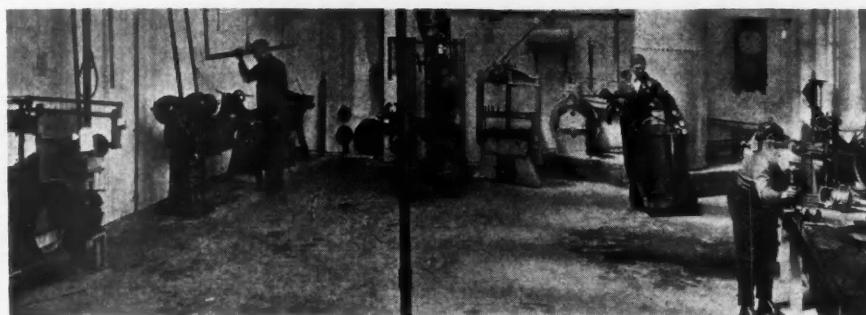
**\$32,115,350** is therefore the potential shop equipment market for 1931 among trade outlets in the truck industry, comprising 1700 exclusive truck dealers, 450 branches, 1250 independent grinders and engine rebuilders, 2750 independent repair shops, and 27,000 combination truck and passenger car dealers.

By  
George  
T.  
Hook,  
Editor

THE above figures are so interesting that we itch to supplement them at once with explanatory details. But we'll just have to scratch our impatience for a while with one hand while with the other we convey some information on the subject of under-equipment of truck trade outlets. This subject is the keystone of the above table for, after all, if trade outlets were well supplied with shop equipment, the potential market for such equipment would lack somewhat in luster.

The present state of under-equipment of trade outlets is pretty well shown in the table on page 15. The column to which your attention is called is headed "Number of Shops Unsold." An eye cast down this column immediately is attracted by the size of the figures opposite such items

of equipment as car washers, connecting rod and piston aligners, portable hand electric grinders, floor cranes, jacks, lathes, bench-type presses, relining and riveting machines, spray painters, valve grinders, etc., etc. A thorough recount is unnecessary because it would merely be a repetition of what the reader can see with his own eyes. But in this column of unsold shops is told a statistically graphic story of the goal which trade outlets in the truck industry must reach before they can claim to have attained a status of normal efficiency. Obviously, this should be the aim of every shop catering to truck users, because the cost of inefficiency is too great a price to pay out of the nose without making an effort to cure so extravagant a catarrh. And a cure is essential because the operators of



# SURVEY SHOWS SHOPS

CONTINUED FROM PAGE 13

trucks place so great a dependence upon proper maintenance that to be unable to give operators satisfactory, efficient service is to jeopardize the earning ability of the operators' vehicles. Which merely creates a boomerang that flies back and swats the trade outlet right where it hurts hardest—in the region of the cash register.

It is now a well-established point that trade service outlets are insufficiently equipped. Heretofore this has been a pretty generally conceded conjecture, but the survey recently completed by COMMERCIAL CAR JOURNAL furnishes this conjecture with a support that elevates it out of the realm of pure guess-work. Now that we are around to the survey we can stop scratching the itch and put the hand to work.

## • Figuring the Market •

The table on the opposite page showing the market for shop equipment among trade service outlets was constructed on the basis of a thorough census of equipment in use among such outlets in the Philadelphia area. Every shop was checked on the 42 items of shop equipment listed on the next page in addition to certain other items listed in the table as miscellaneous. In every case the amount invested in each piece of equipment was procured. In analyzing the results it was found that types of equipment in use and the amount invested therein varied with the trade classification. It was decided, therefore, that in projecting on a national scale the results of the survey procured in an area considered typical, the projection would be more accurate if this variation in classifications were taken into

consideration. Since there are five classifications, i.e., exclusive truck dealers, truck factory branches, independent grinders and engine rebuilders, independent repair shops and combination truck and passenger car dealers, five sets of estimates were made for each piece of shop equipment and for each heading, such as number of shops sold, estimated value of market sold, estimated value of replacement market, etc. All of the percentages and average investments produced by the Philadelphia survey were applied nationally with results that are evident in the table.

## • Allowances Made •

A word of explanation is in order. The estimates would have been subject to criticism if no allowances had been made for the fact that all of the equipment used by independent repair shops, independent grinders and rebuilders and combination dealers is not used exclusively in the servicing of trucks. It is used in the servicing of passenger cars as well. Therefore, a study was made which resulted in the allocation of the following values which were strictly applied: 100 per cent of the value of equipment was apportioned to truck work among exclusive truck dealers; 100 per cent among truck factory branches; 65 per cent among independent grinders; 85 per cent among independent repair shops, and only 24 per cent among combination truck and passenger car dealers.

It should also be borne in mind that the survey involved no consideration of hand tools, special tools and a host of other items which unquestionably would swell the sold, replacement and expansion market



# ARE UNDER-EQUIPPED

## THE MARKET FOR SHOP EQUIPMENT

Among Truck Sales and Service Outlets 33,150 in Number  
 Divided as follows: 1700 exclusive truck dealers; 450 truck factory branches;  
 1250 independent grinders and engine rebuilders; 2750 independent repair  
 shops, and 27,000 combination truck and passenger car dealers.

Type of Shop Equipment	Number of Shops Sold	Estimated Value of Market Sold	Estimated Value of Replacement Market	Number of Shops	Estimated Value of Unsold Market	Potential Market Replacement Plus Unsold Market
Air Compressors.....	28,637	\$3,228,018	\$538,001	4,513	\$625,128	\$1,163,129
Anvils.....	18,596	74,672	5,000	14,554	55,800	60,800
Bearing, Boring, Aligning Fixts.....	768	208,347	21,134	4,211	603,959	625,093
Bins or Shelves.....	33,150	7,896,562	526,007	*	789,656	1,315,663
Car Washing Equipment.....	7,042	713,685	118,948	11,358	1,604,565	1,723,513
Chargers and Other Electrical.....	12,748	917,569	122,469	20,402	1,985,331	2,107,800
Conn. Rods & Piston Aligners.....	11,050	154,564	30,912	20,400	260,903	291,815
Drills—Portable Electric.....	32,650	1,581,606	316,322	500	48,797	365,119
" Pedestal.....	8,390	1,095,988	99,666	6,760	1,282,127	1,331,793
Fire Extinguishers.....	8,266	46,084	5,760	24,884	167,907	173,667
Forges.....	3,928	83,401	4,170	4,597	115,105	119,275
Grinders—Bench.....	30,958	414,873	69,146	2,192	136,630	205,776
" Port. Hand Electric.....	7,850	325,424	65,085	10,800	498,188	563,273
" Crankshaft, Cyl., etc.....	1,250	5,001,750	500,175	*	500,175	1,000,350
" Pedestal.....	5,562	398,088	66,348	8,131	509,312	575,660
Hacksaws (Power).....	3,081	118,225	29,531	4,055	145,587	175,118
Hammers, Air, Electric.....	3,511	176,810	44,202	3,627	194,310	238,512
Hoist—Block & Fall.....	24,663	1,294,311	215,731	8,487	478,709	694,440
" Floor Cranes.....	20,289	773,217	77,320	12,444	640,748	718,068
" Monorails & Hoists.....	16,125	460,349	76,559	7,077	648,389	724,948
Jacks—Hydraulic.....	13,105	267,555	74,180	20,000	475,425	549,605
" Mechanical.....	21,457	1,222,177	271,635	11,693	473,067	744,702
Lathes.....	8,448	3,556,047	237,702	24,702	5,876,302	6,114,004
Lubricators—Grease Guns.....	28,382	758,081	151,615	4,768	133,126	284,741
Millers—Shapers-Planers.....	368	207,040	13,803	1,011	680,160	693,963
Motors.....	8,334	380,122	38,011	11,316	538,752	576,763
Presses—Bench Type.....	4,409	134,336	8,956	28,741	345,493	354,449
" Floor Type.....	27,920	955,445	63,703	5,230	364,618	428,321
Relining and Riveting.....	21,414	476,833	79,471	11,736	238,721	318,192
Running-in Stands.....	3,056	232,800	15,520	3,611	366,540	382,060
Spray Painters.....	9,857	190,256	47,564	22,043	524,880	572,444
Stands—Engine.....	14,752	424,651	42,465	7,568	231,264	273,729
" Drill.....	8,727	123,966	12,395	24,423	273,939	286,334
" Transmission.....	12,113	83,300	51,553	6,331	42,044	93,597
Tanks—Cleaning.....	4,012	59,639	3,976	5,054	152,884	156,860
Tire Changing Equipment.....	3,056	31,040	6,208	19,070	295,628	301,836
Valve Grinders.....	3,798	53,184	10,637	29,352	386,909	397,546
Valve Seat Refacers.....	23,978	1,129,454	188,243	9,172	634,724	822,967
Vises.....	33,150	1,256,817	253,365	*	125,681	379,046
Welding-Cutting Torches.....	20,358	956,111	239,027	12,794	435,845	674,872
Wheel Aligners.....	3,056	23,280	3,880	28,844	305,745	309,625
Work Benches.....	33,150	1,001,197	100,119	*	471,200	571,319
Total for Above Items.....		\$38,486,874	\$4,846,514		\$24,664,273	\$29,510,787
Miscellaneous Items.....		2,973,126	1,268,836		1,335,727	2,604,563
Grand Total.....		\$41,460,000	\$6,115,350		\$26,000,000	\$32,115,350

\* Expansion market estimated at 10 per cent of existing inventory.

NOTE: This tabulation does not include estimates for hand tools which is a considerable item in itself.

values. These will be the subjects of an additional survey at a future date.

Nor does it take into consideration the attractive shop equipment market among the 5000 fleets having 15 or more trucks, represent-

ing an estimated total of 300,000 trucks. Replacements and expansion due to increased registrations among these 5000 fleets have been given an estimated value of \$3,780,000 annually, according to a survey made by this publication.

# AFTER HOURS

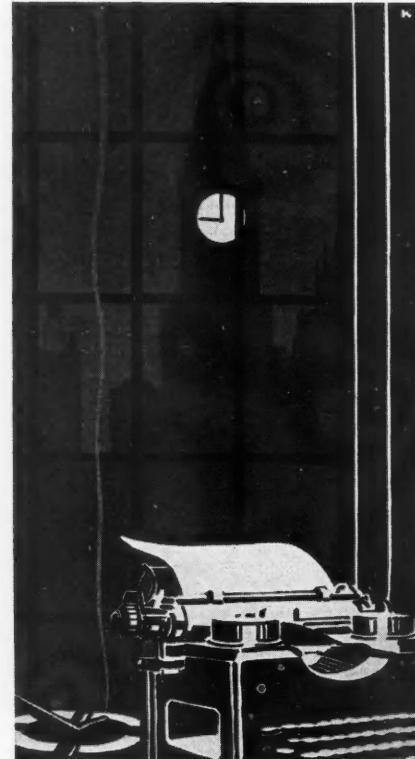
We Spill Some Beans by Telling the Inside Story of This Special Issue

A YEAR ago when the stock market took a nose dive fortunes which it had taken years to accumulate were lost in a comparatively few hours. A similar observation applies to the making of special issues of a publication, and particularly to this Special Shop Equipment and Maintenance Number. Thumbing through the journal you might say to yourself that "here is an issue I could finish in about three hours and not skip a word." And that might even include an intermission to see how the furnace was coming along or, if you were a particularly fast reader, a stroll down to the Elks' Club for a plate of bean soup and a ham sandwich.

Yes, finished in three hours. And an editorial staff of experts had to devote more than a month of effort to research, analysis and composition in order to prepare three hours' worth of reading matter! That will give you some idea of what is known as editorial responsibility.

Obviously such responsibility is not taken on thoughtlessly. There had to be, in this case, a pretty sincere conviction that a shop equipment and maintenance issue would not only be helpful to those engaged in selling, repairing and using truck transportation but was actually desirable. Nothing but the realization that the shop was the keystone of success could have persuaded us to give this branch of the industry such signal recognition.

The shop is the keystone of success. Take the truck seller. If his service facilities are poor, he doesn't sell many trucks because truck customers depend upon him to keep their trucks running. On the other hand, if his facilities are good, customer satisfaction is assured and so is success if profitable operation of this department is a management policy. The same holds true of the independent repair shop. If the shop is ill-equipped it will attract very little paying business. The truck owner won't twiddle his thumbs for days waiting for a job that another well-equipped shop



could handle over night. It is axiomatic that a truck laid up for repairs butters no parsnips. In fact it eats up the parsnips. The individual truck owner's success, therefore, hinges upon the shop. The problem of the large fleet owner is no different. His shop must be up to snuff. If it isn't the shop superintendent will find himself snuffed out and so will the firm. Trucks must be kept in repair in order to make money. The vital dependence on proper and speedy maintenance is too evident. Any fleet owner would be in a he\*\*uva fix if all or half his trucks suddenly stopped churning. The shop must not fail.

With this issue the die is cut and henceforth one of these special issues will be punched out annually. The editorial problem, of course, will be to present such information on shop matters as is most opportune. It wouldn't do to go on rehashing the same sort of stuff year after year. The aim of each issue will be to inspire the involuntary exclamation,

"Those are exactly the things I wanted to know about at this time," or the voluntary admission, "Here are things I should know about."

Such an ambitious program naturally had to have a starting point. We could not safely begin post-graduate work before imparting the fundamentals. Modern maintenance methods, shop practices and all the rest, we reasoned, were, if you were looking for rock bottom, dependent upon shop equipment. Shop equipment, therefore, was the logical starting point. But what to do about it? Thinking caps were donned and they produced a question: "What can shop equipment do? Not theoretically, but actually and practicably." Here was fundamentalism in all nakedness. So nude in fact that at first it looked silly and you couldn't look at it without laughing out loud. But a little more thought proved that far from being silly, it was serious and by far the most important thing that could be done as a starter. You can prove this to your own satisfaction. Consider the lathe. Sit down and try to figure out all the jobs for which a lathe can be used. Name, for instance, all of the general operations and then the slew of specific operations. When you have reached the end of your knowledge, take your list and compare it with the list on page 40 which it took a staff man three days of research to prepare. If the published list doesn't give you an entirely new conception of the versatility of the lathe, drop us a poison-pen letter, or a pineapple or something.

That's just one piece of equipment. The same results apply to all of the pieces treated in this issue. Not enough is known about what shop equipment will do. This issue should and will if it is studied take care of that need. It should furnish fleet and trade and service prospects with a knowledge of equipment that will do three things: it will stimulate purchase; it will be of incalculable value in making judicious purchases, and it will enable them to get all possible use out of equipment purchased.—G. T. H.

# Back of every Chevrolet Car



You buy with confidence when you invest in a Chevrolet Six. Your own business judgment tells you it must be a good, reliable automobile. *For every new Chevrolet is backed by the most liberal service policy that ever applied to a low-priced car!*

This policy—a definite signed service agreement, given to you on delivery of your Chevrolet Six—protects your car investment *completely*.

Under its terms, no charge is made

for either the parts or the labor involved in any replacements covered by the Standard Warranty. And any one of Chevrolet's 10,000 dealers anywhere in the United States or Canada will gladly carry out the provisions of this policy.

Every business executive knows the dollars-and-cents value of protection such as this. And the Chevrolet Six is the only car so low in price to give you such a liberal service policy!

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN  
Division of General Motors Corporation

## CHEVROLET SIX

# Brake Tools Stop

## TOOLS FOR SHORTENING THE STOP

### INSPECTION AND TESTING

Decelerometer

Brake tester

Floor type

Wheel type

Clearance gages

Pedal depressor

### ADJUSTMENT AND REPAIR

Wheel pullers

Jacks (see page 42)

Wheel jacks

Special wrenches

Spanners

Drills

Riveter

Dummy drums

Lining cutters

Lining clamps

Lining grinder or buffer

Adjusting jigs and gages

Drum lathe

Drum grinder

Cylinder hones

Bleeding tanks

Modern Equipment Saves Time and Money in Brake Repairs and Assures Efficient Deceleration in Operation

Some sort of job of brake adjusting can be done with ordinary hand tools, but something much better is expected and demanded. Brakes must be right and stay right. All up-to-date shops take advantage of time and labor-saving possibilities of special brake equipment.

Inspection, adjustment, relining, overhauling of brake systems and testing are performed easier and better with the latest machinery and equipment.

Actual replacement of lining has been simplified by the use of machinery to such an extent that many shops make no direct charge for applying lining to shoes. Lining is cut to exact lengths in a special cutter or is purchased already cut or molded to size. In a riveting machine the hole and countersink are drilled in the lining in exact alignment with holes in the shoe. One stroke of riveting attachment fastens rivet in place.

Every brake drum job includes inspection to determine whether or not work is necessary, and testing to make sure that the work has been done properly. For these two allied jobs, a lot of special machinery has been designed. The larger testing machines simulate road conditions and measure resistance of each wheel to turning when brakes are applied with the wheels in motion. Some give stopping distance in feet at a certain number of miles per hour, while others register resistance, from which stopping distance is computed.

**B**RAKES on trucks operating in modern city and country traffic accomplish the impossible day after day and year after year. They stop heavy trucks as quickly as passenger cars when a traffic officer throws up his hand. On long hills they control heavy weights running at high speed and make emergency halts, which dissipate more energy than the engine develops. They do all of this without getting hot enough to "annoy" but an inch or two distant. With adjustments only at long intervals they endure these conditions for thousands and thousands of miles.

Keeping brakes in condition to meet these demands requires knowledge and skill plus equipment for the application of both. A mechanic may be good at judging clearance between lining and drum of external brakes, but he cannot set enclosed, and therefore invisible, internal brakes to clearance of say, .008 in. at the heel by guess.

Brakes must be adjusted to factory specifications for clearances and settings. Four-wheel brakes to be effective must be adjusted so that each wheel does its allotted share of braking. The sum of 1 brake,  $\frac{1}{2}$  brake,  $\frac{1}{4}$  brake and  $\frac{2}{3}$  brake does not equal a good set of four-wheel brakes.

### • Testing by Force •

PORTABLE equipment for measuring braking effort usually is attached to each wheel in turn and the resistance is measured on a scale. Another type of brake testing device measures the deceleration of the vehicle on the road. When a vehicle stops quickly, there is a force which tends to throw passenger and driver toward the windshield. These devices measure this force and convert the results into stopping ability.

Clearance between lining and drum on most internal brakes is very small. On all brakes it must be set accurately. Inspection holes are now provided in most brake drums so that clearance between lining and drum can be measured with a feeler gage. However, in making major adjustments it is convenient to make several measurements in rapid succession and dummy drums are used for this purpose. These dummy drums have spokes instead of solid disks on the side and expose most of the shoe surface to inspection. Clearance gages are also used for determining position of the shoes and condition of wearing surfaces of brake drums. These gages work from a center point of the axle and measure distance from this center to lining and to drum.

Renewing lining on drums which are off center, grooved, flared or roughened in spots is a waste of

# STOPPING WORRIES



time and money. Special attachments for ordinary lathes and special brake drum lathes are used for reconditioning brake drums. Although machining can be done on the drum alone, many service executives prefer to machine the brake drum while it is in place on the wheel. In fact, some shops take a very light cut even on new drums to make sure that the wearing surface is true with the axle. On brake drums of certain materials, turning is difficult, so grinders are used.

The operating mechanism of hydraulic brakes obviously differs from that of mechanical brakes and several special devices have been designed to speed up this work. For bleeding a hydraulic brake system to rid it

of air, overhead pressure tanks are used which supply several gallons of brake liquid under pressure for feeding to the brake lines. Wearing parts of the system include the master cylinder and the wheel cylinders. In case these become roughened they are reconditioned by special hones driven by electric drills.

Brake work calls for the use of much equipment which is used for other operations. Jacks and stands are examples. Wheel pullers are necessary for brake operations as well as axle repairs. Measuring clearance between lining and drum in thousandths of an inch calls for the use of feeler gages and trueness of brake drums is measured by dial gages (see page 34).

# WHEN A BODY HAS

Thirteen Trades, Each With Its Own Special Devices, Are Used to Complete Jobs

## WRINKLE REMOVERS AND GENERAL "UPLIFTERS"

### TALENT:

- Carpenters
- Painters
- Upholsterer
- Blacksmith
- Cabinetmaker
- Sheet metal worker
- Welder
- Machinist
- Sign writer
- Glazer
- Plumber
- Riveter
- Electrician

### INSTRUMENTS:

#### WOODWORKING

- Brace and bits
- Saws
- Hand
- Power
- Planes
- Chisels
- Glue pot

#### PAINTING

- Spray equipment
- Grinders
- Buffers
- Touch-up kit
- Stripping equipment  
(see page 37)
- Compartments
- Exhaust fans
- Brushes

### FENDERS

- Dolly blocks
- Hammers
- Bumping
- Ding
- Half
- Flanging
- Fender pliers
- Shrinking tools
- Rollers
- Sand bags

### BODY

- Spoons
- Hinge straightening tool
- Glass removing tool
- Glass cutters

### UPHOLSTERY

- Trimmer's kits
- Hammers
- Trimming
- Upholstering
- Scissors

### GENERAL

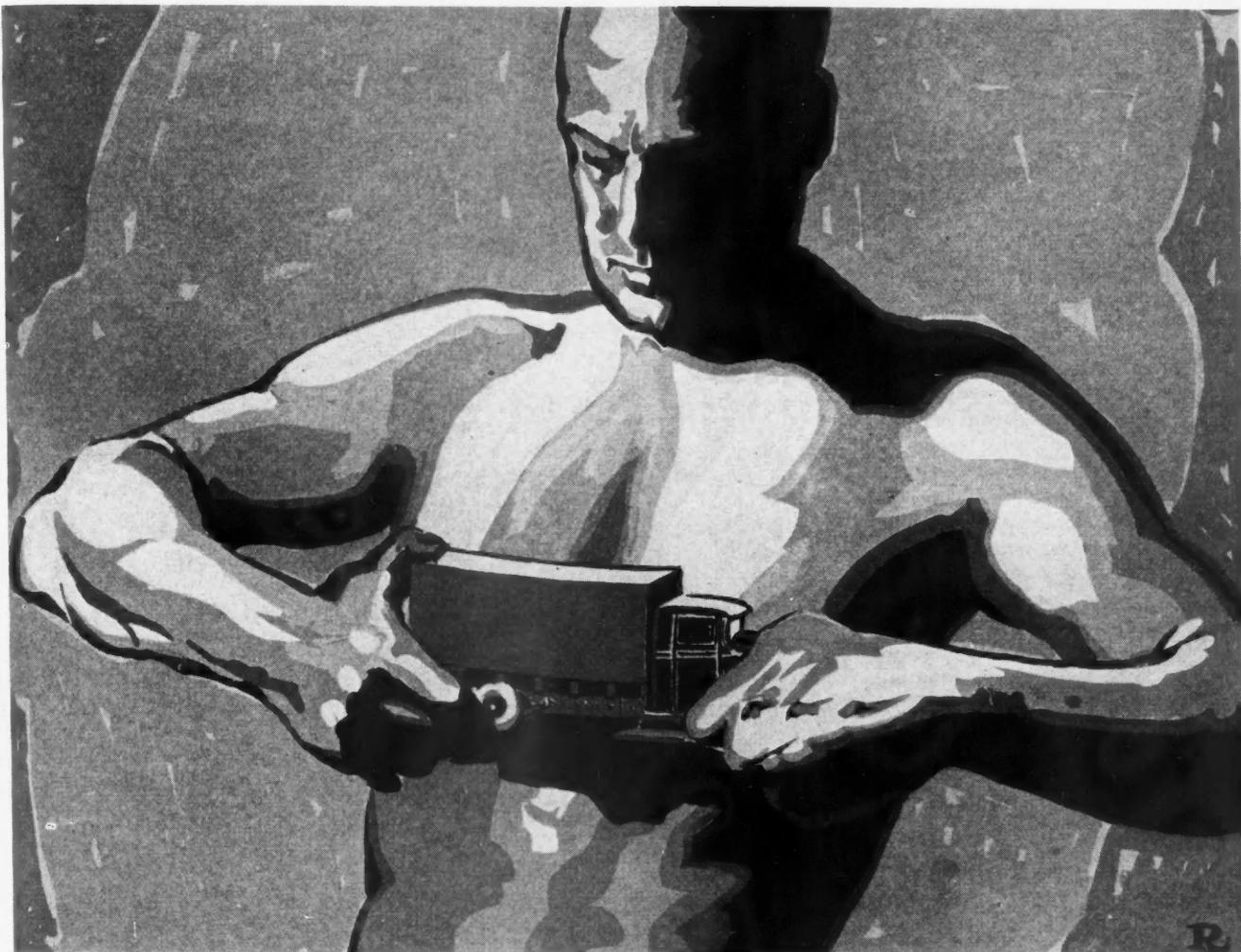
- Mallets
- Rivet chisel
- Shears
- Snips
- Flexible files
- Knives
- Welding outfit
- C clamps

**A** SERVICE MANAGER of long experience who received a service bulletin on a new model cab filed the bulletin without reading it, thinking cab maintenance too trivial to engage the attention of a busy man. A few days later, still wondering why the factory went to the trouble to get out that bulletin, he took time to look up shop records. Much to his surprise, he found that body, cab and fender repairs exceeded total volume of brake work and in fact outranked many other divisions of maintenance.

Other maintenance men have come to realize the importance of body repairing because of other circumstances. One turned over in his mind the word "coupe" as applied to a cab by a salesman. He, too, was inspired to investigate. He knew that a de luxe cab requires the same sort of care as a passenger coupe body but he did not know how much cab repairing his shop did in a year. The total, made up largely of insurance jobs on wrecks, surprised him greatly.

Maintaining bodies and cabs and unwrinkling or replacing sheet metal work on trucks calls for the art of carpentry, painting, upholstery, blacksmithing, cabinetmaking and sheet metal working. For many of the operations involved, ordinary shop tools are well suited but for many more, special devices are necessary. A hammer, drift and punch suffice for a door hinge job but for removing dents in fenders so simple a tool as a hammer appears in the special form of ding, half-hammer or mallet. Damage to sheet metal parts of trucks, to which mechanics apply the term "tinware tink-

# A BODY TO REPAIR



ering," ranges all the way from little bends and scratches on fender edges to accordion pleats in hoods caused by front-end smashers and the effects of sideswipes which slash fenders and running boards and gouge body panels.

Frequently the appearance of damaged sheet metal gives little indication of the difficulty of making a repair. One of the most troublesome jobs on bodies is that of removing a circular dent in a flat body panel. The metal is stretched and ordinary hammering will not restore the original smoothness. On the other hand, a crumpled fender may respond to rolling in a few minutes.

## Reshaping Bent Metal Parts

BENT sheet metal parts are restored by hammering, bending and rolling. Numerous special devices have been developed for each of these operations. Hitting a hard blow with a machinist's hammer may substitute one dent for another. A smoothing effect is obtained by backing up the hammer by blocks of metal called dolly blocks. Because there are so many different shapes to straighten,

these blocks, usually sold in sets, are made in a variety of sizes and with surfaces curved to divers degrees. Canvas bags filled with sand are used for the same purpose. Hammers with convex heads, which are a total loss for driving nails, are effective for shaping metal. Striking upward beneath a fender with the wheel in place with an ordinary hammer is a feat worthy of a contortionist and to meet this need, curved and offset hammers have been designed.

Many dents and bends in fenders may be removed easily by using fender rollers. A roller comprises a C-frame with a roll at each point. Placed over the fender the roller can be moved in any direction. The frame is held at an angle placing one roll ahead of the other.

TURN TO PAGE 52, PLEASE

# DO RIGHT BY ENGINES

Engines Harassed by Trouble Stand Up  
Because of Machine-Type Maintenance

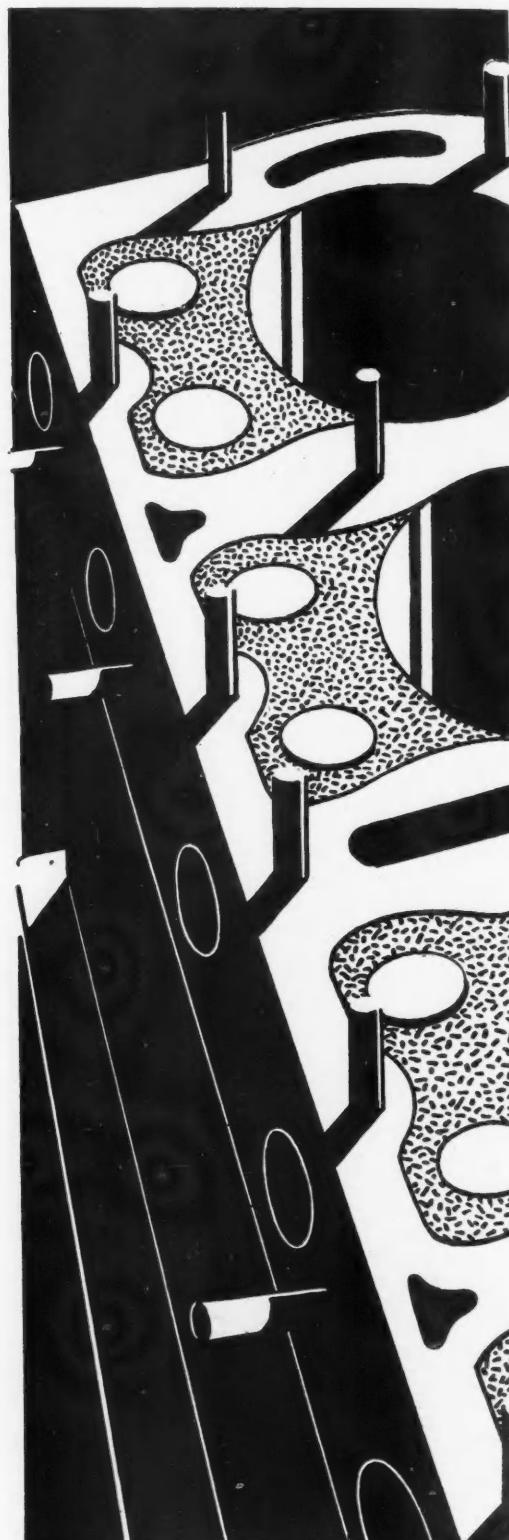
## MECHANISMS MINISTERING TO ENGINE NEEDS

### GENERAL TOOLS DRAFTED FOR ENGINE WORK:

- Electrical equipment (see page 26)
- Welding equipment (see page 28)
- Floor equipment (see page 29)
- Drills (see page 30)
- Precision tools (see page 34)
- Car washers (see page 37)
- Hand tools (see page 38)
- Lathes (see page 40)
- Lifting devices (see page 42)
- Presses (see page 46)
- Grinders (see page 47)
- Air compressors (see page 49)
- Special tools (see page 50)

### SPECIAL TOOLS FOR ENGINE WORK:

Bearing (main and rod)	Anvil and jigs
Borers	Piston pin
Grinders	Inserters
Scrapers	Hole reconditioners
Reamers	Piston ring
Compression gage	Compressor
Connecting rod	Groove cleaner
Straightening irons	Remover
Aligners	Running-in stand
Crankpin reconditioners	Spark plug cleaning brushes
Cylinder	Valve
Lifting hooks	Grinders
Borers	Refacers
Grinders	Reseaters and seaters
Hones	Testers
Reamers	Freeing tools
Carbon	Rocker arm levers
Cleaning brushes	Seat testers
Scrapers	Valve guide
Dead center checking fixtures	Pullers or drivers
Engine testing equipment	Cleaners
Dynamometers	Valve spring
Oil pressure test equipment	Lifters
Piston	Compressors
Vises	Keeper tools
Aligners	Holders



# WITH THE RIGHT TOOLS



**N**O discredit accrues to truck engines because a multitude of mechanisms are required to minister to their needs, and their ailments are numbered in scores. On the contrary, that marvel of engineering design, a modern truck engine, stands up under almost impossible demands. It is expected to show the snap and power of a racing engine, to run wide open for long periods, to possess the durability of a stationary steam engine, to get along with little more attention than a watch and finally to respond instantly to adjustments and repairs.

Engine maintenance is a complex business, comprising several major divisions, each a vocation in itself. Operations on engines and their accessories constitute more than one-third of all operations listed in the Truck Rapid Flat Rate published by this company. Certain groups of these operations, such as ignition and electrical work, crank-shaft and cylinder grinding, and welding engage the attention of specialists.

**E** • **Mechanical Helpers** • EQUIPMENT used to maintain engines includes much that is expressly designed for engine work, in addition to large percentages of that applicable to other types of work. Thirteen of the classifications of shop equipment in this issue include tools and/or devices used to repair and maintain engines. A common job like carbon and valves and tune engine requires, for example, precision tools in the form of feeler gage and perhaps a dial gage for timing, an electric drill, a flock of hand tools, an ignition point grinding jig and possibly an electric test bench, special tools in the form of valve spring keeper holders, a jet of compressed air for dislodging carbon particles and valve refacer or lathe. If the cylinder head be large or obstinate, a chain hoist lifts it, bad tappets call for use of a grinder, a cracked manifold brings a welding torch into play.

Part of the complexity of engine maintenance is due to the fact that an engine with its accessories is a complicated mechanism performing a wide variety of chemical and mechanical functions at the same time. Mechanical construction is well known, but how many count up the materials embodied in an engine? There are a dozen or more, including: cast iron, cast steel, alloy steels, copper, aluminum, bronze, cork, felt, rubber, costly metals and alloys, cotton, asbestos, rare earths, gums, chemicals and synthetic products. It mixes gasoline and air in proportion to its needs, distributes oil upon its various moving parts in minute but accurately controlled quantities, keeps itself cool in spite of temperatures of combustion high enough to melt iron and steel and for contrast heats other parts such as intake hot spots to high temperatures.

No mechanic would undertake any engine job without some sort of equipment. But mechanics got along a few years ago with equipment which would not suffice today. Many of the old-timers were proud of their hand-scraped two or three-day 90 per cent main bearing jobs. Some of them today are turning out almost perfect bearings in a few hours. In hand-scraping days they determined how tight or loose a bearing was by pulling on a bar on the flywheel rim. Now they machine bearings to factory standards for clearance. The job fits better, runs-in in shorter time and lasts longer.

**U** • **Close Limit Work** • UNDERLYING work of this character are machines which work to very close limits and devices which make measure accurately. Without them modern maintenance would be lost. An example of precision in manufacture is an interchangeable non-adjustable rod or main bearing. Tolerances are so small and manufacturing so accurate that a bearing picked at random from stock may be installed in an engine anywhere.

A carbon and valve and engine tune-up job makes use of much more equipment than that previously mentioned to show diversity of tools for engine maintenance. Grinding valves has ceased to be a hand job and, in fact, no actual grinding of valve face on valve seat takes place in many shops. Valve face and valve seat are machined and tested for leakage without any of the screw driver twirling formerly considered indispensable for a good fit.

Starting on a carbon and valve job, a mechanic loosens the cylinder head nuts with a socket wrench supplied with a handle giving considerable leverage. After the nuts are loosened, he spins them off with a speed wrench. After pulling the cylinder head up over the studs, he hands it to a helper, who removes carbon with a wire brush attached to an electric drill. After opening up the valve chamber, a mechanic places a piece of sheet metal, cut to fit, about the valve lifter assemblies, if this area is open to the crankcase, so that the keepers and tools will not slide down into the crankcase. A lot of time can be lost fussing around with valve spring keepers, so mechanics see to it that lifters are at hand adapted to the particular type of engine on which work is being performed.

Scrapers, a wire brush on an electric drill and blasts of compressed air remove carbon from pistons, cylinders and valve ports. Valves are cleaned and refaced in a refacing machine. Meanwhile, seats are machined with reamers or stones. A special mounting for a dial gage is useful in measuring the extent, if any, which the old seat is out of true with the valve guide. Obviously, seat must be aligned with guides and expanding pilots, for reamers or stones keep the machining in line.

#### • Valve Jobs •

BEFORE valves are reinstalled, the tappets are run down to allow for cutting down of valve faces and seats. Sets of tappet wrenches, perhaps a special wrench or two, are employed for this operation. After parts are reassembled and the engine ready to start, the tappets are adjusted to factory settings as measured by feeler gages or feeler stock.

Ignition gages, usually with a leaf for plugs and another for breaker points, come into play for checking ignition. Synchronizing gages or timing lights are needed to insure team work between breaker points in double-arm distributors. If the job includes tightening of water pump, this operation is performed with a

## DO RIGHT BY ENGINE

special wrench which simplifies this troublesome task.

Both special engine equipment and standard tools and devices are available for other engine work as well as those affecting performance. Bearing work is an example. Even on non-adjustable bearing replacement there is much to be done. An oil-pressure test requires a supply of oil under pressure to test conditions of both main and connecting rod bearings. Many shops test alignment of each connecting rod removed from an engine for inspection or repairs.

When an adjustable bearing is replaced, the new shell is machined to a fine fit by bearing fixtures. Even the fillet is cut as it should be, rather than gouged by scrapers.

#### • Fitting Wrist Pins •

FITTING piston pins and bushings brings out a whole troop of special equipment. Bushings are removed by pullers or pushed out in arbor presses. New bushings are inserted by drivers or presses. Accurate fitting is essential and both reamers and grinding stones bring the bushing bore to correct size and alignment. A piston vise holds the piston in position while piston pin locks are removed and the pin withdrawn. Power-driven reamers save muscular effort in jobs of this kind.

Reamers for piston pin fitting usually are equipped with pilots to insure alignment of the two holes in opposite sides of the piston. These tools must have fine adjustments. Pins are fitted in aluminum-alloy pistons to be tight when cold and loose enough to withdraw at 212 degrees. This shows how close are the limits on this work and how well modern equipment meets the needs of mechanics.

Although many engines now built have main bearings which can be removed without taking the engine

out of the frame and dismantling it, main bearing work is by no means at an end. Bearing shells of replaceable type bearings are machined to size by boring bars or line reamers. Both outfits provide means for aligning the cutting members with the cylinder block and keeping them in place while the work proceeds.

#### • Cylinder Machining •

CYLINDER reconditioning is a branch of engine maintenance which reflects the influence of engine design. When cylinders generally were detachable and cylinder heads were not, cylinder bores were reconditioned on an internal grinder at the time of general engine overhauls. Making the cylinder head separate from the cylinder block opened up the possibility of reconditioning cylinder bores without removing engine from the chassis.

Tool makers capitalized the opportunity and offered a variety of machines for boring, reaming and grinding cylinder bores. Simplest of the machines are full-diameter grinding stones, commonly called hones. Abrasives are mounted in metal slides in

## JOBS THAT WILL MAKE A TOOL

### They Can Not Be Handled Properly Unless

- Fan shaft bearing, renew
- Water pump assembly, overhaul
- Water pump packing nuts, tighten all
- Broken manifold stud, renew
- Carburetor, remove, disassemble, clean and reinstall
- Engine combination operations which include work listed separately
- Remove and reinstall engine
- Inspect internal condition of engine
- Tune engine
- Clean engine
- Check compression, tappets, ignition system, fuel system and all timing to locate engine miss
- Scrap carbon
- Oil pump, remove, inspect and reinstall
- Oil lines, clean
- Make oil test on bearings
- Rings, renew all, align and adjust rods
- Standard pins and bushings, renew all, align and adjust rods
- Piston pins, renew all, align and adjust rods

# WITH THE RIGHT TOOLS

an adjustable frame and the assembly is rotated in a cylinder bore by a heavy-duty portable electric drill. This type of reconditioning usually is employed to remove small quantities of material and for finishing after machining. Both reamers and boring equipment are used for heavy cuts as well as light jobs. When a cylinder is badly scored beyond the range of ordinary over-sizing, it may be bored or reamed large enough for insertion of a dry-type iron sleeve.

## • Salvage by Grinding •

INTERNAL grinders, mentioned elsewhere in this issue, are used by large shops and by shops specializing in grinding. A cylinder block is bolted to a base with the bores extending toward the grinder head. A small wheel revolving at high speed travels in a spiral path through the cylinder, grinding as it goes.

Crankshafts and main bearings in modern engines wear very slowly. Complete overhauls at intervals of 100,000 miles are not uncommon. Among the factors which contribute to this result are: generous bearing

areas, balancing, lubrication and high-grade material. Nevertheless, journals and crankpins do need attention at times. Running for long periods with loose connecting rod or main bearings tends to pound flat spots on the shafts. Crankpin tools provide a cutting blade to shave the shaft down to a smooth finish. Both pins and journals are ground in external grinders. A jig is employed to swing the shaft while pins are ground.

An inert piece of metal such as a flywheel seemingly requires no maintenance. The coming of the self-starter brought this part into the repair field. Broken ring gear teeth must be replaced, either by cutting the teeth and turning the wheel to fit a shrunk-on gear or installing a new gear in case flywheel and gear are not integral. Machining the flywheel is an easy lathe job.

## • Check Flywheels •

AFTER a flywheel is installed, mechanics make sure that it runs true by checking with a dial gage. The gage is bolted to the flywheel housing and set to reveal the slightest wobble.

If clutch trouble has been experienced, the flywheel is used to check the face of its housing. In this case the dial gage is attached to the flywheel and revolved slowly around the flywheel housing flange.

A truck engine is no small armful. When it is removed for over-haul or substitution of another engine, something more than "brute strength and awkwardness" is in order. Up-to-date sky-hooks take the cuss out of this work. Lifting hooks are attached to the cylinder block or head and the engine gracefully wiggled loose from the frame and lowered upon an engine stand.

The engine stand makes light work of moving the engine into the shop and posing it in various

unusual positions while mechanics perform the operations which comprise a general overhaul.

Working beneath an engine in a chassis is no afternoon tea party. While a mechanic can dive under the truck with a handful of tools and squirm around on the ground outdoors if necessary, he is not willing to do work in this fashion in a shop day after day. Creepers make a mechanic more comfortable and better able to work. Improved portable lamp brackets direct light where it is wanted, trays on casters provide space to put removed bolts, nuts and parts and hold tools.

During these days when quietness is demanded of truck powerplants, more attention is given front-end chains or gears than was devoted to them in the rattle-bang-no-horn-needed period. Pulling a gear off a camshaft is no easy undertaking if edges of the timing gear case almost touch the gear, crankshaft gears and sprockets cling tenaciously to their positions. Mechanics armed with special pullers and drivers make short work of these jobs. To support the front end of the engine or to raise or lower it as desired during progress of the job, chain hoists or jacks are employed.

## • Close Limits •

PRECISION tools are required for inspection of engines and their parts to insure accuracy of repair operations. Many applications of these tools are given in the article on precision tools which appears on page 34 of this issue. Wear of moving parts passes through two stages, the first showing need for repair, the second for replacement of part or parts. Repair work has been placed upon a precision basis by setting up factory standards and providing means whereby mechanics may meet them. This reduces the human element to a minimum, fit of parts, tightness or looseness of bearings and adjustments do not differ because mechanics' judgment varies.

There is a similar chance for lack of uniformity in deciding whether or not a part shall be replaced with a new, or reconditioned, unit. Much progress has been made in this field. Factories establish limits on tolerances, so much wear calls for repair, so much for replacement. This puts salvage of parts and units on a definite basis.

Engine factories spent large sums of money on equipment to reduce the cost of manufacture and improve their product. These efficiencies may be offset by waste in an under-equipped shop. During the useful life of an engine the same operation may be performed many times, with possibility for loss, or gain, in each.

## KIT THROW UP THE SPONGE

### They Are Tackled With Special Engine Tools

#### Piston, ring and pin assembly, renew one

Hone or bore all cylinders, renew all (oversize) piston, pin and ring assemblies, align and adjust rods

Remove rod assemblies and reinstall

Align one connecting rod

Main bearings only, renew all

Regind crankshaft, renew main and rod bearings and align rods

Renew crankshaft, main and rod bearings and align rods

Clean carbon, grind valves, tune engine

Valve stem guides, renew

Guides, ream oversize

Adjust tappets

Rocker arm bushings and shafts, renew and adjust tappets

Retime valves

Change or gears, renew all

Clutch assembly, remove, disassemble, reassemble and reinstall

Flywheel, remove and reinstall or renew

Ring gear, renew

# TESTERS TELL WHY "JUICE" GOES WRONG

And Special Equipment Simplifies  
the Repair of Modern Starting,  
Lighting and Ignition Systems

ONCE upon a time trucks venturing out at night revealed their presence on city streets by two flickering oil lamps and on country roads by gas head lamps, drivers forced engines into activity by brute strength and strategy, the only electrical equipment comprised magnetos or dry battery ignition systems. Few, if any, in that day foresaw a time when electrical equipment would be almost universal.

Heralded or not, the day arrived. Electric starters won their way and the generators and storage batteries needed for their functioning gave a ready means of supplying lights and, if desired, ignition.

Electrical equipment appeared on more and more vehicles. Testing, adjusting and repair of this equipment grew up from a humble beginning to assume the full stature of a department of maintenance. In fact shops doing nothing but this kind of work became common.

Mechanics of those hand-cranking days added knowledge of volts, amperes, relays, regulators, specific gravity and ground connections to their other accomplishments.

Taking care of electrical equipment of trucks requires special tools and devices. An elementary operation like moving the third brush on a generator is easy with a special wrench, almost impossible on some generators without one. An armature growler compels windings to sing out their good or bad condition, saving a lot of testing.

Development of electrical equipment and devices for their mainte-

nance goes hand in hand. When designers of ignition distributors decided to split the ignition job and give half the cylinders of an engine to one set of points and the other half to another set they brought on the necessity for synchronizing the two sets of points. Timing lights and synchronizing gages helped perplexed mechanics to get the best of this job.

**S • Tests Before and After •**  
STARTERS, generators and distributors, like other units, must be checked both before and after repairs. Tests, however, must include both mechanical condition and electrical performance. The latter cannot be done with ordinary shop tools. Electrical test instruments are indispensable.

These three units usually can be removed from an engine without much trouble and it therefore is convenient to remove them for test and repairs. Testing is best performed with the unit in operation and modern testing equipment drives the unit at operating speed.

Compact test benches or stands now on the market test not only complete units but component parts. A distributor is tested at varying speeds, then its current is run through a test coil, and a test condenser brought into action. Generators are tested with their own reverse current relays and with test relays.

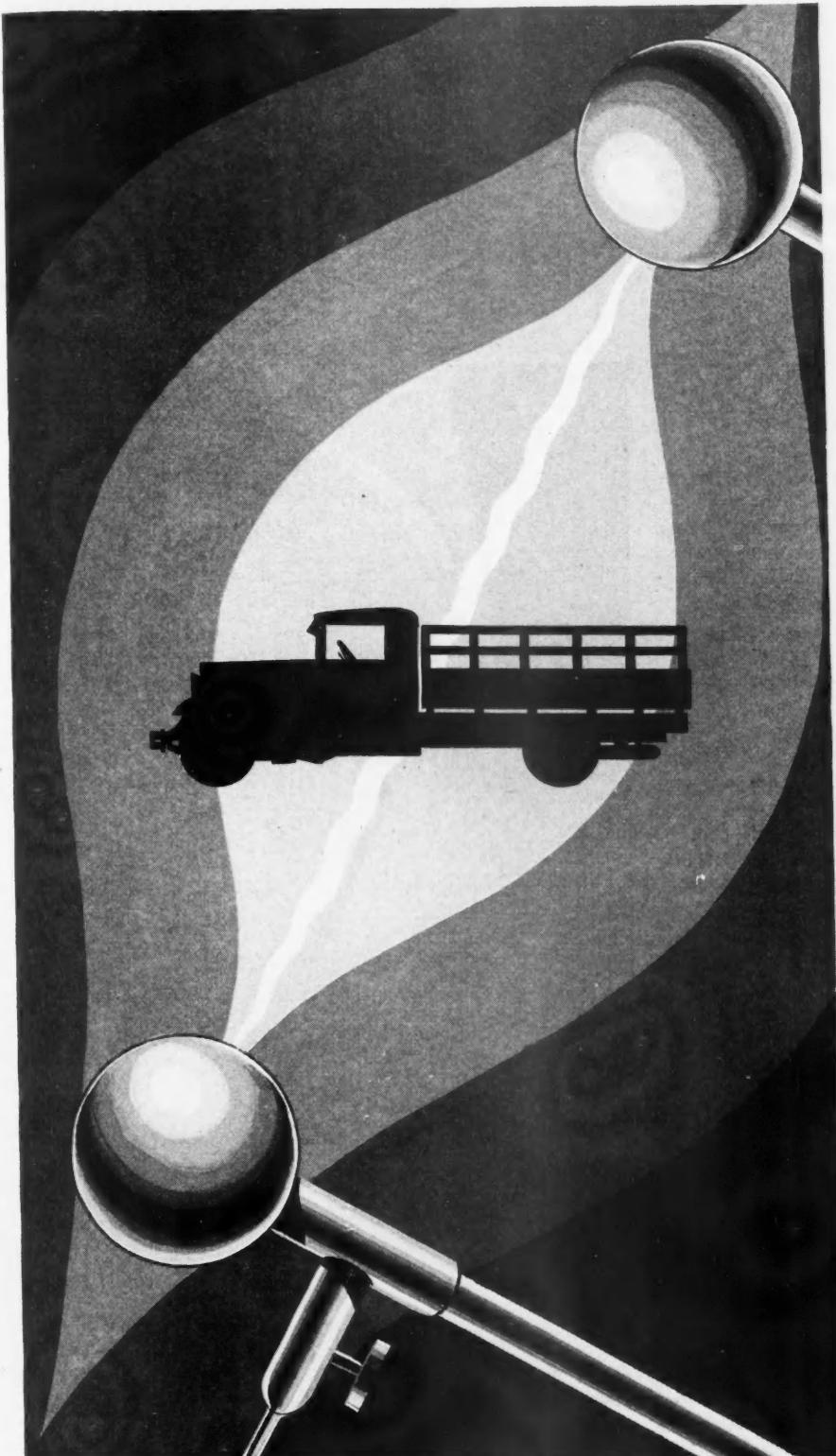
Special equipment is no less valuable for repairing distributors, starters and generators than for testing these units. Disassembling

and reassembling comprise a large part of the work but there are other tasks to perform and devices wherewith they may be accomplished with dispatch. Turning commutators may be done in a bench lathe or a special lathe. Undercutting insulation in a commutator is done with a special high speed cutter; hacksaw blades are not approved in modern shops. Work on Bendix starter units is simplified by special tools.

Glaring headlights are under the ban everywhere. Focusing bulbs and aiming the lamps cannot be done in haphazard fashion. Targets and screens help shops to meet strict standards of state laws and regulations. Optical instruments, called headlight testers, check focus of bulbs and direction of beam of light and expedite routine tests and adjustments.

Battery service is naturally linked with electrical equipment. If a starter fails to function the fault may be in the battery or in the starter. Hydrometers and voltmeters show the condition of the battery, at least enough to indicate whether or not the battery should be removed for charging or repairs.

Chargers step down line current to lower voltage, transform it from alternating current to direct and regulate flow of current as desired for charging. Transforming from a.c. to d.c. is done by motor generators or by rectifiers. The motor generators embody an alternating current motor which drives a direct current dynamo. Mercury arc rectifiers have no moving parts and they supply direct current at lower voltage than the incoming alternating supply.



Charging usually is done at constant potential or constant current. In the former the voltage is kept constant and a battery takes a large amount of current when discharged, this current diminishing gradually until the battery is fully charged and floats on the line. In constant current charging the voltage changes and amperes remain approximately constant from the time the battery is put

in the charger until it is fully charged. Tearing down batteries and replacing insulation and plates is another division of electrical maintenance which has become a business in itself. Although portable electric drills and a few other common shop tools are used for this work most of the equipment is peculiar to battery repairing. Tools for battery maintenance and repair are listed in box at right.

**BENJAMIN FRANKLIN  
WITH KITE AND KEY  
STARTED THIS:**

**ELECTRICAL EQUIPMENT FOR:**

**Testing:**  
Test benches  
Growlers  
Voltmeters  
Ammeters  
Volt-ammeters  
Headlight testers  
Lamp testers  
Coil testers  
Spark plug testers  
Test lamps

**Adjusting and Repairing:**  
Remagnetizers  
Special wrenches  
Synchronizing gages  
Pole spreaders  
Contact point grinding attachments  
Spring scales (see page 34)  
Undercutters  
Lathes (see page 40)  
Bendix repair equipment  
Wire terminal tools  
Timing lights

**BATTERY TOOLS:**

Cell testers  
Cadmium testers  
Electric drills (see page 30)  
Discharge sets  
Chargers  
Charging connectors  
Terminal pullers  
Cell pullers  
Hydrometers (see page 34)  
Carriers  
Hand trucks  
Fillers  
Post builders  
Steamers  
Lead molds  
Stills  
Plate press  
Plate racks  
Fire pots  
Gloves  
Apron

# WELDING KEEPS METAL HUNKS OFF JUNK PILE

**H**EAT at 6000 to 8000 degrees controlled at the end of a hand tool saves repair shops large sums of money by salvaging broken parts, otherwise scrapped; saves time by repairing parts without need of removing from chassis; makes practical alterations in size of metal parts, such as wheel cut-downs; and simplifies stiffening operations, such as welding riveted seams and reinforcing with liners and channels, etc.

Metals formerly riveted or bolted together are now not only joined but actually fused into one piece. This is accomplished by bringing the edges of pieces to be joined or cracks to be repaired to a liquid state and adding more material, if needed, by feeding a filler rod into the molten mass. Although either electric arc or gas flame can be used to produce the heat, each possesses individual characteristics which adapts it to certain classes of work.

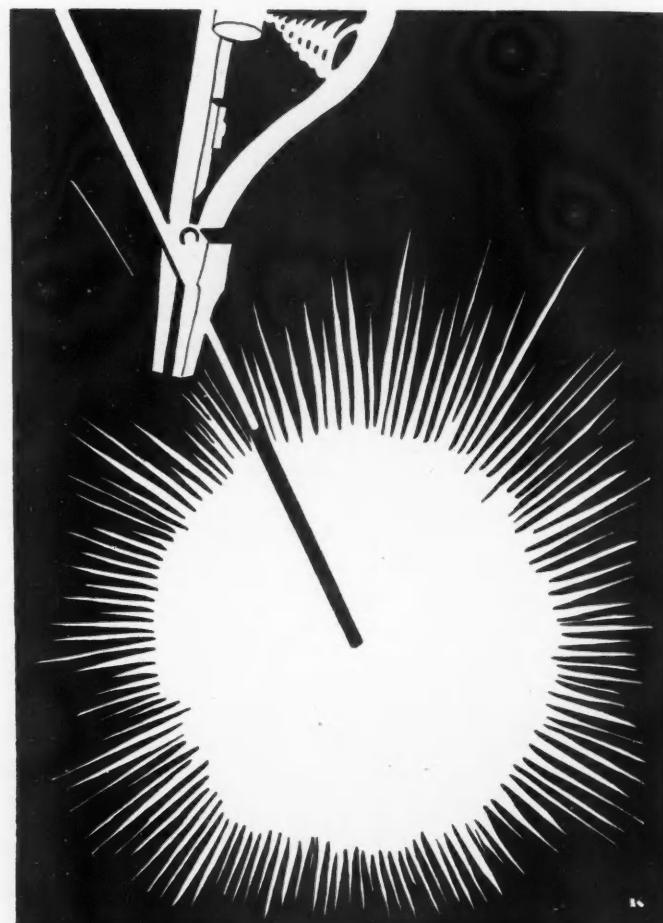
## • Wide Scope of Uses •

**O**F the two types of welders the oxy-acetylene, or gas flame, outfit has a wider scope of application. Cast iron and non-ferrous metals such as aluminum, copper, brass, bronze, etc., are most successfully handled with a gas flame. Cast steel can also be handled with gas and, in fact, acetylene is preferred on light steel work, such as fenders, fuel tanks, panels, etc., because there is less likelihood of burning through and results in a smoother job. Application of the acetylene flame to metal parts as a heating agent has also been found very satisfactory in straightening operations.

Bronze welding is another department of metal joining and is an exclusive feature of acetylene outfits. When two parts are brought to a high temperature without melting and joined by molten bronze the process is bronze welding. The bond is formed by the bronze gripping into the expanded pores of the heated metal, forming myriad minute anchors as the metal cools. The difference between a bronze weld and a fusion weld is that the latter more nearly approaches the natural characteristics of the pieces joined and becomes an integral part of the pieces, whereas the bronze weld, built up of a different material, is more like a joint, the bronze serving as a connector. While such unions do not form as strong a bond as welds, they are an excellent substitute for fusion welds when the latter cannot be employed or is not essential. Bronze welding is used extensively on light cast iron sections such as

TURN TO PAGE 60, PLEASE

November, 1930



## HOT TOOLS FOR HOT JOBS

### HOT TOOLS:

Electric arc welders  
Gas flame welders

### HOT JOBS:

Joining  
Fusion welding  
Bronze welding  
Brazing  
Soldering  
Stiffening  
Cutting  
Straightening  
Bending

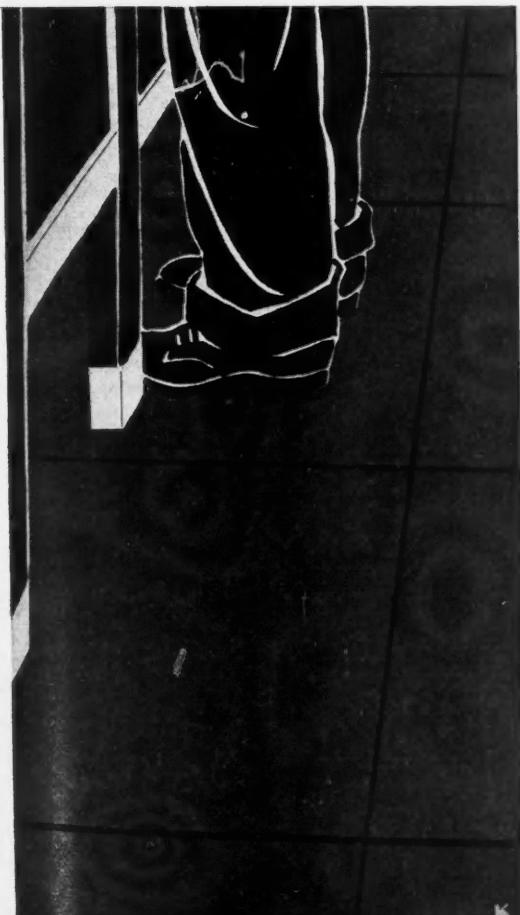
### HOT EQUIPMENT:

Welding table  
Stops  
Holes  
Blocks  
Preheating furnace  
Blow torches  
Cutting torches  
Clamps  
Tressels  
Trucks  
Goggles  
Skids  
Igniters  
Gloves  
Shields

# STRAIGHTEN BENT BACKS WITH FLOOR EQUIPMENT

## Keep Work on a High Plane With:

- Portable work bench
- Stands
- Engine
- Transmission
- Rear axle
- Horses
- Fixed supports
- Adjustable supports
- Hand trucks
- Creepers
- Tool kit cart
- Pits
- Racks
- Lifts



**M**ECHANICS cannot work to advantage while lying, squatting on the floor or stooping. Such work not only endangers the health of the mechanic but is costly in the loss of time, inefficient work and loss of tools and small parts. When the floor is used as a work bench, mechanics are constantly getting up and down for special tools, looking for small tools scattered around the floor or jockeying around the unit under repair in an effort to secure a comfortable working position.

In shops where close watch has been kept on efficiency, the amount of work done on the floor or in uncomfortable positions has been greatly reduced. The height of the average work bench has been found best for all-around work and there is a marked gain of efficiency when a unit is taken to the work bench or mounted in a stand instead of being repaired on the floor. Alert service executives, recognizing the many advantages accruing from use of equipment designed to obviate floor-work, are equipping their shops with such items as portable work benches, trays on caster wheels for tool kits, adjustable creepers, engine, transmission, and axle stands, horses, fixed jacks, racks or pits, etc.

Portable work benches are employed in many shops to provide a place, off the floor, for tools being used on any particular job and to make available a vise and work space near the job. Space is provided for an assortment of hand tools, and bins may be added for small parts. These benches are mounted on casters and can be moved easily right up to the job.

### • Avoiding the Squat •

**U**NLESS a shop is equipped with a rack or pit there are some operations in which stooping and squatting on the part of the mechanic cannot be entirely avoided. Much of the disagreeableness of such work, however, is eliminated by use of small creepers with low adjustable back rests. Low work is further simplified and made easier by furnishing the mechanic with a tray mounted on casters for carrying his tool kit. The tray is moved about the floor in company with the mechanic and if he acquires the habit of replacing tools on the tray, no tools need be scattered about the floor.

Engines are heavy and when removed from the chassis, unless they are mounted in a stand, are awkward to handle and difficult to work on. Stands are available with fittings and adjustments for practically all types of engine suspension and the engine can be revolved in the stand to any position suitable to the mechanic and the operation being performed.

Transmissions can be overhauled on the floor but this method wastes time and imposes discomfort on the mechanic. Transmissions of smaller trucks can be taken to work benches without difficulty, but in heavier trucks, however, it is difficult to remove the unit. In such cases, it is much easier to use a special jack to support the transmission while it is being removed from the chassis. Some of these jacks also serve as stands to hold the unit during the overhaul after which both stand and jack are pushed back under the chassis for reinstalling the transmission in the chassis.

Unless the shop is equipped with stands, rear axles in many

TURN TO PAGE 60, PLEASE

# THE DRILL IS A SHOP'S

It Serves in 16 Out  
of 24 Major Repairs

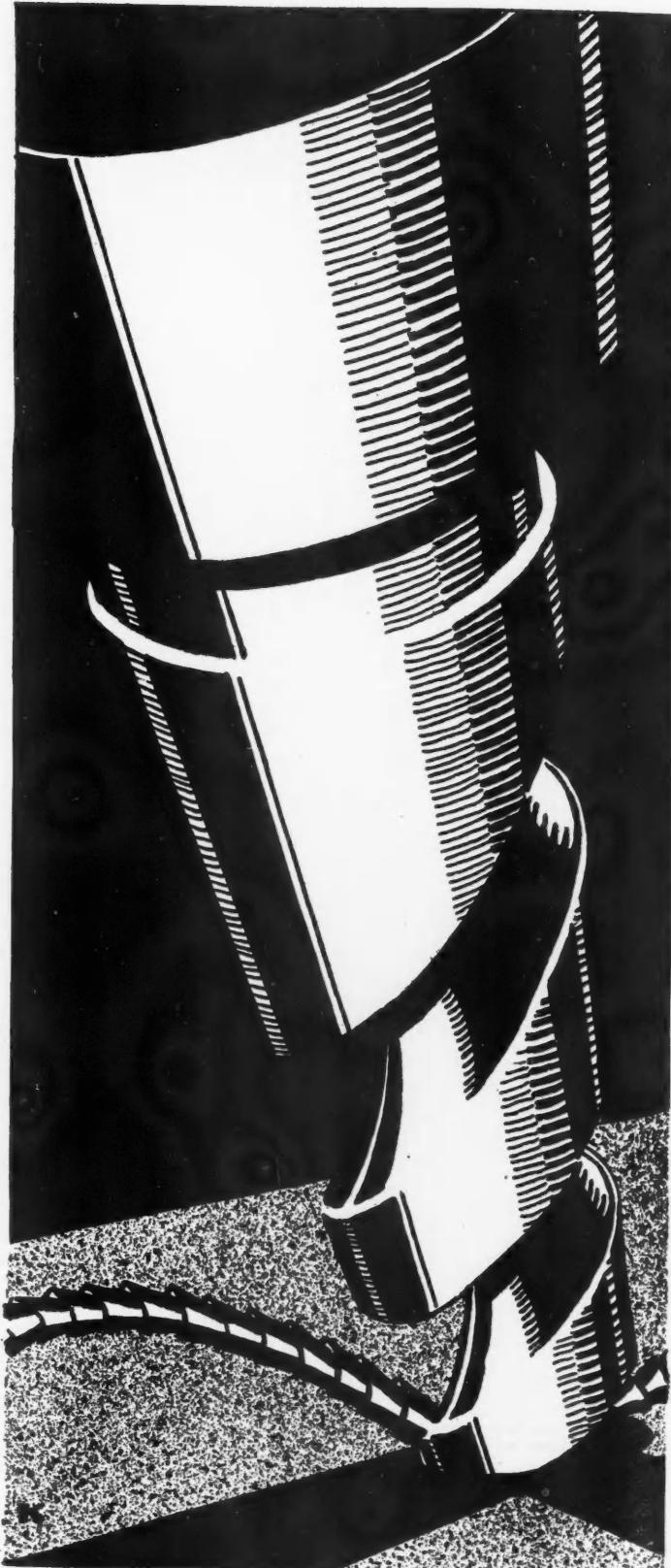
## WHY DRILLS ARE MORE THAN DRILLS

### THEY MAY BE USED FOR:

- Wire Brush Cleaning
- Small Bore Holes
- All Surfaces
- Grinding
- Roughing
- Buffing
- Polishing
- Sawing
- Driving
- Hones
- Valve Seat Stones

### WHEN WORKING ON:

- Brakes
- Carbon and Valves
- Cylinders
- Piston Pins
- Bearings
- Steering Gear
- Front Axle
- Clutch
- Differential
- Fenders
- Body
- Springs
- Battery
- Tires
- Vehicle Cleaning and Polishing
- Installation of Accessories



# JACK-OF-ALL-TRADES

**T**HE drill, one of the most important and versatile items of power equipment in the repair shop, can properly be termed the shop's general-purpose utility tool. Primarily designed for drilling operations, it has been adapted to serve in a number of other very important operations. Equipped with such attachments as grinders, brushes, buffers and valve-guide cleaners, the working scope of the electric portable drill has been extended to include 16 out of 24 of the most frequently executed flat rate operations.

There are two classes of drills—fixed and portable. The fixed type is available in various floor and bench models and a large range of sizes. Portable electric drills are available in sizes ranging from  $\frac{1}{4}$  in. to  $1\frac{1}{2}$  in., although the following four sizes are more commonly used:  $\frac{1}{4}$  in.,  $\frac{1}{2}$  in.,  $\frac{5}{8}$  in. and  $\frac{3}{4}$  in.

The portable electric drill is virtually a hand tool weighing, in its more common sizes, from 7 to 25 lb. It is a self-contained unit comprising a handle and switch, a housing, which encloses a universal motor, fan, reduction gears, clutch, and a chuck for holding drills and other attachments.

#### • A Portable Powerplant •

**B**ESESIDES serving as a portable power unit, the electric drill, when mounted in a stand, may also serve as a vertical drill or a fixed horizontal power unit.

As a portable drill, the tool plays a very important part in carbon and valve work. A stiff, tempered steel wire brush is furnished for carbon cleaning and when attached to the drill removes carbon from cylinder heads, tops of pistons, valve ports, etc., better and quicker than ever was possible by the old hand method. Another time and labor-saving attachment for use in the drill when working on an engine tune-up job is the valve-guide cleaner. Valve seating stones driven by a portable drill save much time and anguish. They are used for grinding valve seats in cylinder blocks and finishing seats after reaming. A few seconds of grinding, after reaming, gives the seat the same finish as a refaced valve. Many shops also use the drill for cylinder honing. Although such jobs can be done without a stand to support the drill, to do so is very tiresome, besides by using a stand greater accuracy is obtained.

The portable drill has also been found very useful in a lot of other miscellaneous jobs about the shop, such as cleaning, grinding, buffing and polishing. An unusual but effective cleaning job is that of removing mud, tar and rust from the under side of fenders by use of a stiff wire brush. The drill equipped with hole saws is also very useful in cutting holes for mounting accessories on dashboards and for cutting holes in floor boards.

By using bench or post stands, the portable drill can readily be converted into a fixed drill. These stands include a bracket for carrying the drill,

which can be raised and lowered on the column by an operating handle. The drill can also be swung around the column to any desired position.

#### • Serviceable in All Departments •

**M**OUNTED in bench stands in a horizontal position, the portable drill again serves in a multiplicity of operations in all departments of the shop. Attachments are available for many operations in the battery shop, such as special lead drills for removing cell connectors, wire wheels for cleaning parts and grinding wheel for keeping all edge tools sharp. In the tire department the bench-mounted portable drill is a very important item of equipment, saving considerable time in repair operations. In addition to the wire brush and grinding wheel needs, special rasps are provided for vulcanizing and spot repairs. A round-nose rasp is employed for roughening surfaces preliminary to vulcanizing and a taper rasp for quickly cleaning and roughening smaller cuts and holes.

The fixed or stationary-type drill is used mostly to perform heavier work than is practical with a portable drill. Power to operate the fixed drill is furnished either by an electric motor or line shafting. The drill is fed into material by a lever which controls a vertical rack, and the material being worked is raised or lowered by an adjustable plate.

Despite the great versatility of the drill, in ordinary shop work it is interesting to know that shops on the average are under-equipped and could to their advantage more than double their present supply. Actually service stations in the United States are under-equipped to the extent of 172,600 drills, there being in use some 190,800 drills. These figures are based on a survey recently completed by the Chilton Class Journal Co. and covers some 95,000 service stations.

Drill requirements, of course, vary with the size of the shop. In order to determine generally requirements of shops according to size, all shops in the survey were reduced to a jobs-performed-per-month basis. Working along these lines, some very interesting facts were determined and computed relative to the actual number of drills employed and recommended in each of six classes of shops. The following table is self-explanatory. Figures are given for four common sizes of drills.

	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.	$\frac{3}{4}$ in.
Under 100				
Actual	0.1	0.6	0.2	0.1
Recommended	1.0	..	..	1.0
100-300				
Actual	0.9	0.7	0.3	0.2
Recommended	1.0	1.0	..	1.0
300-500				
Actual	0.9	0.6	0.4	0.3
Recommended	2.0	2.0	..	1.0
500-700				
Actual	1.0	.08	0.7	0.2
Recommended	2.0	2.0	..	2.0
700-1000				
Actual	1.3	0.6	0.6	0.3
Recommended	3.0	3.0	..	2.0
Over 1000				
Actual	1.3	1.1	0.5	0.3
Recommended	4.0	3.0	..	3.0

# SLICK DEVICES LAY

Money and Repairmen Exhausted in Primitive Wrestling Bouts Can be Saved by Use of Ingenious Robots

HERE are many ways of changing tires. One way is with hammer, chisels and broken spring leaves. Equipped with these implements, the man whose duty it is to do the removing has a merry time of it. The performance starts with removal of the wheel from the truck, which soon develops into a free-for-all with the man finally coming out on top but looking like a chimney sweep. Then as if to give vent to his spleen on the prostrate wheel, the man, bolstering his courage with exclamatory expletives, commences to pummel rim and casing with a hammer. After much of this and some gouging and jabbing with chisels and spring leaves, the tire finally gives up the rim and the conqueror slowly straightens up with throbbing pulse, gasping breath, and ready for the shower. And the vanquished tire, if not apparently lacerated and cut, has suffered bodily strains and ruptures and if subjected to a few more such experiences might collapse completely. This is one way of changing tires.

As a matter of fact it is the only recourse of shops not equipped with modern tire-changing equipment. But there are better ways. The modern way of changing a tire is with the aid of jacks and tire removers. Supplied with these devices the tire man lets the machines do the heavy work with no injury to tire or himself. And the work is done in a fraction of the time needed by the old-fashioned hand method.

#### T • Saving Man-Hours •

TO remove a wheel from an axle or a tire from its rim are operations calling for considerable energy in the absence of proper equipment. Equipment manufacturers have stepped into the breach with labor-saving devices, designed not only to reduce the number of man-hours necessary when handling large tires, but also to make the work less of a strain for those whose duty it is to remove, repair and replace.

The first step in the repair or replacement of a tire is, of course, the jacking up of the truck. This is accomplished by a garage jack (discussed in article on page 42). After removing wheel or rim nuts, as the case may be, with socket wrench and turning off valve lock nuts, the wheel or tire with rim is slipped off the truck axle and rolled to a tire-changing machine. When working with solid tires, however, the wheel is slipped off the axle onto a truck wheel cradle and transported to press. Truck wheel cradles are generally attachments for mounting on special high lift garage jacks and embody two arms and a saddle. The arms project up and outward and

are equipped with two adjustable clamps in their ends to hold the tire in position.

Tire changers—of which there are various makes and types on the market—are designed to furnish a quicker, easier and safer means for removing and mounting old or new pneumatic tires on all types of rims or demountable wheels, including split or solid rims and wires or disk wheels. These machines, handling any size of truck pneumatic, are especially useful when removing tires which have become rusted onto the rim. They effect great saving in time and eliminate danger of injury to casing or rim.

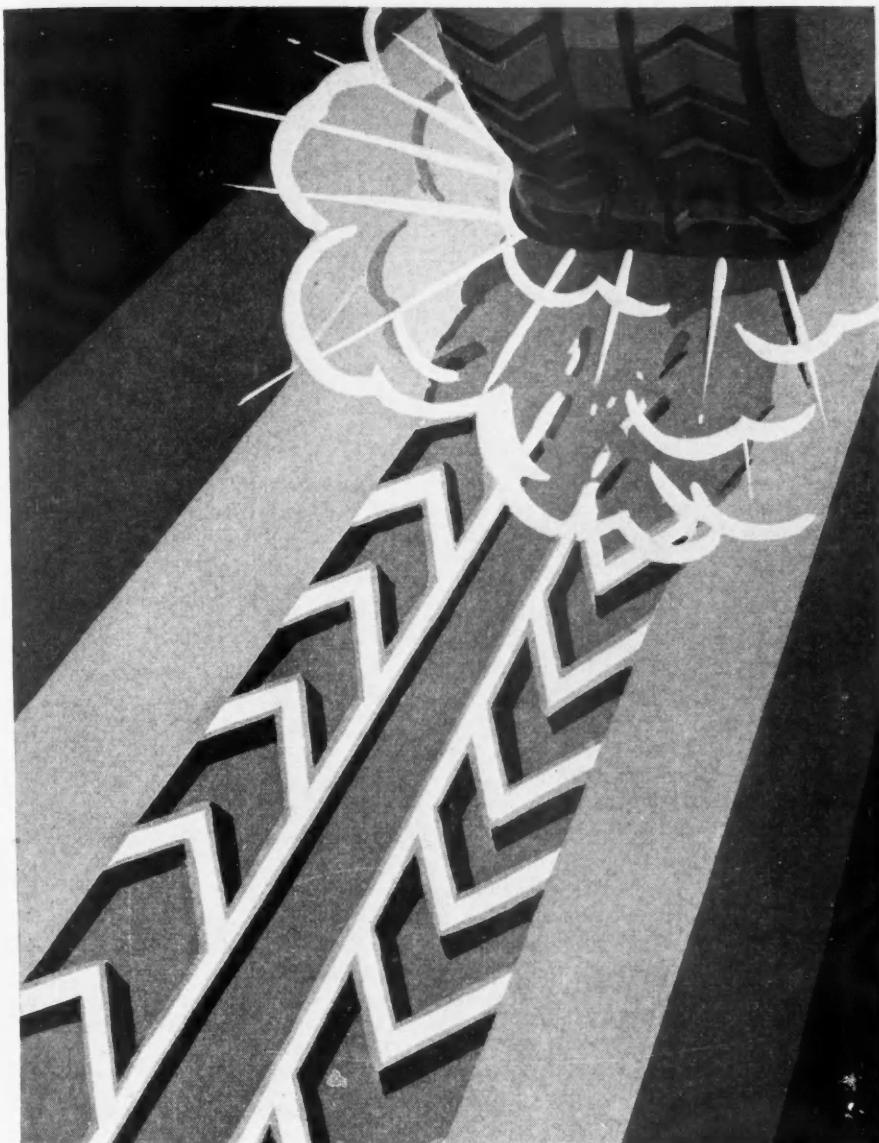
#### C • Use Metal Fingers, Arms, Jaws •

CHANGERS for collapsing split rims embody three legs supporting three arms which serve as a table for the tire and rim. Three jaws projecting upward at right angles from the arms secure the rim firmly in place by gripping the rim at the lower edge. Adjustment to the size of the rim is provided in one or more of the jaws. After a split rim is set in the device, a hook on the top of the power jaw is slipped over the rim and caused to pull the rim inward. The free end of the tire is then raised and removed from the rim with a spiral motion. Split rim changers are frequently operated by air pressure. There is another type changer which is very similar in construction but manually operated for handling all kinds of rims both split and solid, as well as wire and disk wheels. It incorporates a goose-neck arrangement which is placed over the tire from the outside and between the rim and the tire. The goose-neck is operated by a lever and pulls the tire out and downward. There is yet another machine for forcing heavy tires off solid rims. In this type, the wheel is placed vertically on an expanding chuck and expanding fingers, which are hinged near their end and brought to correct diameter by a lever on one of the arms of the chuck so that the tips of the metal fingers fit between the tire and rim. A hand wheel on a screw forces the fingers in, thus removing the tire from rim.

The tire spreader is a machine designed to facilitate casing inspection and making repairs inside the casing. It consists of a stand and an upright with arm at the top to support the tire and a set of hooks which engage both sides of the tire at the base. The hooks are pulled down by foot or air power, thus spreading the tire.

Equipment necessary in the repair of tires includes tire repair stands, sectional molds for vulcanizing and spot repairs, rim anvils for straightening kinks

# TIRE TROUBLES FLAT



in rims, tanks for inspecting and testing inner tubes, hot plates and vulcanizers for tube repairs and special hand tools.

Tires are awkward to handle, but machines, which are very similar to the tire spreader, are available for holding tires in position and spreading them out when making repairs. Mounted in this machine a tire is skived, roughed, buffed and patched.

Vulcanizers offered today are mostly self-contained units, although some obtain steam power from plant boilers. They provide steam and have air bags which are inserted inside the casing being vul-

canized against heated cavity molds mounted on the outside of the tire. Molds are obtainable in various sizes. Different tread designs are secured by use of liners which are placed in the molds. Some vulcanizers employ heated mandrels instead of air bags. In this type pressure is secured by wrapping heavy tape around the section being repaired. Outside heat is furnished by heaters supplied with live steam through flexible hose or by electric spot vulcanizers. The heaters are placed over the wrapping. This type of machine is also useful in spot repairing.

TURN TO PAGE 52, PLEASE

## INSTRUMENTS FOR A MODERN TIRE DISPENSARY

### Changing Equipment

- Floor jacks
- Garage jacks
- Truck wheel carriers
- Tire removers
- Split rim
- Solid rim

### Repair Equipment

- Pneumatic Tires
  - Tire spreaders
  - Examination
  - Extraction
  - Repairing
- Vulcanizers
  - Sectional
  - Spot repair
- Molds and liners
- Grinders
- Buffers
- Rasps
- Inner Tubes
  - Hot plates
  - Vulcanizers
  - Tube cages
  - Water tanks
- Solid Tires
  - Presses
  - Tread groovers
  - Tread cutters

### Small Tools

- Penknife
- Skive
- Notched knife
- Hooks
- Spatula
- Stitcher
- Rubber mallet
- Socket wrenches
- Rim tools
- Long nose pliers

### General

- Stands
- Rim anvils
- Chain cutters
- Pressure gages

# PRECISION IS KEYNOTE OF MODERN SERVICE

Up-to-Date Shops Keep Time With  
a Full Set of Measuring Instruments to  
Eliminate the Distortion of Guesswork

**G**UESSWORK has no place in the modern repair shop. Instead of mechanics deciding for themselves how tight or loose parts should be fitted, they must work precisely in accordance with standard clearances and adjustments established by factories. Many of these clearances are given in half-thousandths, some go so far as to specify the force needed to withdraw a feeler gage of a stated thickness from the space between two parts.

Manufacturers of precision tools offer many instruments which make it easy for mechanics to work to these prescribed close limits and achieve any desired standard of precision without much trouble.

Measurements for factory standards of maintenance are made in several different ways, each offering the same order of precision. A mechanic uses a micrometer to find out the diameter of an oversize piston pin, thus making a direct measurement. He employs a dial gage to tell whether or not a flywheel runs true, thereby detecting a variation from standard, and sets a breaker point gap by an ignition gage, meeting a standard without measuring the opening.

Many measurements of the latter type, which are popular in service shops, are based upon the coincidence of one line with another. When the two lines meet, the adjustment or setting is correct and the mechanic does not concern himself with the units involved in the measurement. He sets tappets to the thickness of a piece of feeler stock given to him and does not know, or care, how thick it is or whether its thickness is expressed in thousandths of an inch or by metric units. A common operation of this class is lining up of a flywheel mark "IGN" with a pointer in the flywheel housing inspection hole. At this

point ignition takes place a certain number of degrees before or after top dead center, but the mechanic does not need to remember, or even to know, the number of degrees.

Factories use many "go and no-go" gages for inspection. The "go" side of the gage should slip over a part being measured and the "no-go" side should not fit over it. If the "go" side will not fit, the piece is too large and if the "no-go" side fits over the part, the part is too small. Go and no-go gages are used in repair shops for checking wheel cylinders of hydraulic brake systems without measuring diameter of the cylinder directly.

## • Direct Measurements •

**M**ICROMETERS are used for direct measurement of size. There are two types, the outside, which is adapted to measuring outside dimensions of parts, and the inside type, which is employed for measuring diameters of holes. The outside micrometer is used for a wide variety of work: for inspection, for checking size of repair parts, for setting tools, and for machine tool work. These micrometers measure in thousandths of an inch, and even finer divisions can be determined by use of special scales or setting off fractions on a standard scale. The inside micrometer operates on the same principle and to the same degree of accuracy. In measuring large holes such as cylinder bores it is possible to place the micrometer at an angle rather than along a true diameter, and therefore mechanics must be careful in making measurements. A large element of error when measuring holes may be avoided by using a micro transfer gage. This instrument, inserted in the bore, is adjusted to the actual size and after removing, the exact dimension of the bore can be determined by miking the gage.



## HOW PRECISION INSTRUMENTS PRODUCE HARMONY BY ACCURATE GAGING:

### DISTANCE

**Dial Gages Check:**  
 Concentricity of revolving parts  
 Wobble of revolving parts  
 End play in shafts or bearings  
 Bearing clearance  
 Backlash of gears  
 Valve timing  
 Cylinder out of round and taper

**Micrometers Check or Measure:**  
 Condition of circular parts  
 Dimensions of parts  
 Diameter of holes  
 Tool setting

**Feeler Gages Check or Measure:**  
 End play in shafts or bearings  
 Backlash of gears  
 Valve timing  
 Piston clearance

### WEIGHT OR TENSION

**Balance Scales Weigh:**  
 Pistons  
 Connecting rods

### Spring Scales Weigh:

Valve springs  
 Breaker arm springs  
 Clutch springs  
 Brake springs  
 Drag of assemblies  
 Force to withdraw feelers  
 Force to operate brake system

### TEMPERATURE

**Thermometers Check or Correct:**  
 Thermostats and radiator shutters  
 Temperature of lubricants  
 Anti-freeze solution readings

### SPECIFIC GRAVITY

**Hydrometers Check:**  
 Battery electrolyte  
 Freezing point of solutions

### PRESSURE

**Gages Check:**  
 Cylinder compression  
 Tire inflation

### ELECTRIC CURRENT

**Volt-Ammeters Test Lighting, Starting and Ignition Circuits for:**  
 Opens, shorts, resistance and grounds

### STRAIGHTNESS

**Surface Plates, T-Squares, Protractors, Levels, Straight Edges and Bars Are Used to Check:**  
 Straightening operations  
 Alignment of bores and parts  
 Compression, height of pistons (surface plate and scribe)  
 Flatness and trueness (surface plate and feeler gage)  
 Wheel alignment (see page 52)

### VACUUM

**Gages Check:**  
 Boosters  
 Carburetion  
 Manifolding  
 Vacuum tanks

The chief function of a dial gage is to determine amount of variation, either plus or minus, from a known standard. One of its common uses is in checking cylinder bores for taper and out-of-round condition. The gage is mounted upon a sort of sled, set to zero at the top of the bore and pushed into the cylinder. Moving the gage downward shows taper, moving it around the bore shows out-of-roundness. This measurement does not show the actual size of the cylinder bore at any point, but if direct measurement is desired, the dial is locked in position and measured with a micrometer after being removed from the cylinder.

Dial gages are employed in many other maintenance jobs. Mounted on a bracket, the gage determines condition of crankshaft main bearing journals. The bearing cap is removed and dial plunger placed in contact with the shaft. In a special mounting the dial gage measures crank pins for spooling and out-of-roundness. It also shows whether or not a flywheel is true and reveals wobble in ring gears. Measuring backlash in timing gears and rear axle gears, or end play in bearings, is easy with a dial gage, as the plunger magnifies movement so that it can be read easily.

#### • **Feelers Serve Triple Purpose** •

FEELER gages are employed for taking direct measurements, showing variations from standard, and as standards. Tappet clearance is measured directly, clearance between ring and ring groove shows a variation without measuring the width of the ring. For measuring clearance between piston and cylinder walls, feeler gages with extra long leaves are used. Feeler stock, which is strip steel made to precise thickness, is used for the same measurement as those accomplished by feeler gages. Short pieces of feeler stock are issued in some shops for setting inlet and exhaust valve tappets. The stock in this case serves as a standard because a mechanic sets the tappet to the thickness of the stock without caring what thickness of stock his foreman gives him.

Many maintenance operations involve measuring weight, temperature,

specific gravity of liquids, pressure of gases, strength of electric currents and determination of alignment, straightness or smoothness of machined surfaces. Instruments of precision are used for work of this character, as with that calling for close measurement of size.

Engine builders balance piston and connecting rod assemblies very carefully to insure smooth running. Tolerances in weight are of the order of  $\frac{1}{8}$  oz., an amount too small to be detected by "feel." To match this accuracy, repair parts must be weighed before installation. Scales of the type called balances are used for this purpose. Pistons are weighed separately, rods are weighed one at a time and then assemblies are weighed.

#### • **Scales Measure Tension** •

STRENGTH of springs and drag in mechanical assemblies can be expressed in pounds pull, and spring scales are used to weigh these forces. Spring scales registering in ounces check strength of distributor breaker arm springs; other types reading in pounds indicate tension of valve and clutch springs. Drag in a steering gear assembly is determined by attaching a spring scale to rim of steering wheel and pulling the wheel around by the scale. Scales are put to another use in fitting pistons to cylinders. Mechanics differ in their ideas of what constitutes "tight." Therefore, there may be variation in fitting pistons, tight on .004-in. feeler and loose on .003-in. feeler. Fortunately, this sort of tightness can be measured. Fit pistons to 20-lb. pull on feeler strip .004 in. thick and  $\frac{1}{2}$  in. wide leaves no uncertainty.

Fitting piston pins to pistons or bushings is another job in which mechanics must decide tightness to a fine degree. Final check of a reaming job is expressed by pull required to move the big end of the rod against resistance in piston pin and bushings. The piston is clamped in a piston vise and a spring scale attached to one of the connecting rod bolts. A standard pull in pounds, plus or minus a few pounds, takes guesswork out of this fussy operation.

Measuring of temperature is required for engine repair and other op-

erations. Tappet clearance, engine hot, does not mean warm, it signifies clearance with engine at top operating temperature. Some factories give temperature of cooling water for setting tappets. Thermometers join the array of precision instruments for maintenance work. Engine and radiator thermostats must be checked at times for opening and closing temperatures, another thermometer job. There are others. Specific gravity reading of anti-freeze solutions must be corrected for variation in temperature from the standard upon which the scale of the hydrometer is based. Temperature of lubricant in a rear axle or transmission after a long run may reveal cause of leakage or an improper adjustment.

Condition of a storage battery is checked by a hydrometer, which determines the specific gravity of the battery solution. Battery hydrometers and anti-freeze hydrometers have different scales and usually are separate instruments. Both scales may be combined in a single hydrometer, and many models of this type are available.

Tire pressure gages are common pressure measuring devices used in service shops, but they are by no means the only examples of their type. Pressure gages screwed in spark holes show amount of compression and how long a given cylinder retains its pressure, thus checking condition of valves and piston seal.

#### • **Meters for Electrical Repair** •

VOLTMETERS and ammeters are indispensable in electrical repair work. Portable volt-ammeters are used for checking opens, shorts and grounds in chassis wiring and for tracing out wiring.

A host of repair jobs involve checking of alignment, straightness or angles. Straight edges, bars, levels, squares and protractors are used, singly or in combination, for this work. Rear axle housings are checked by straight edges and bars. Cylinder bores must be parallel with each other and at right angles with center line of crankshaft. This alignment is measured on removable-head engines as at right angles to top of cylinder block and is determined by squares and bevel protractors. A surface known to be flat and true, such as a surface plate, has many uses in a shop. It reveals shortcomings of "snaky" piston rings, hills and hollows in filed bearing caps. Serving as a base for a dial gage mounting and, perhaps, a pair of V-blocks, it assists in checking all sorts of parts and assemblies.

## PRECISION IS KEYNOTE OF MODERN SERVICE

# WASHING EQUIPMENT PUTS 'SPIC AND SPAN' IN TRUCKS

OPERATORS are spending a lot of money nowadays to make their vehicles more attractive. Trucks are designed with sweeping lines and finished in pleasing color schemes. Therefore operators are willing and obliged to keep their vehicles clean and fresh looking, especially when the colors run into light shades. As a consequence, washing service and equipment are coming into greater demand.

Car washers either save money or make money. They save money for fleet operators reducing the cost of laundering and make money for dealers selling washing service. In addition, truck washing affords dealers an excellent opportunity for contacting customers, building good will, selling service and even accessories.

To assure economical operation of equipment and, from the service dealer's standpoint, to meet competitive prices and insure profit, consideration should be given such factors as equipment, layout and management.

## ● Three Types of Washers ●

Three different types of car washers are available: high pressure water, water-air and steam. With the water- types, it is possible to spray kerosene, soap or other solutions for cleaning the chassis, engine and removing road tar and paint. Steam is used with solutions for paint stripping, with water for ordinary cleaning and alone for scouring engines and chassis parts. Steam also provides an excellent means for draining and cleaning out rear axle housings and transmissions. All types of washers are used for cleaning major truck parts before repairing.

High pressure systems employ either double-acting single-cylinder pumps or two or three-cylinder single-acting pumps. Both, however, maintain a pressure of about 300 lb. These systems are available in one or two-gun sizes or larger. One-gun units have an output of about 5 gal. to 8 gal. per minute. Air-water systems include an air compressor, air reservoir, water pump and solution tank. These systems spray about 10 gal. of water per minute. Steam systems are made up of a small boiler usually gas-fired with automatic control on burner to govern steam pressure and an elevated tank for solution. There are two hose lines to each nozzle, one for solution and the other for steam.

Complete washing facilities include several other items of auxiliary equipment in addition to the washer, such as lifts, brushes, sponges, aprons, etc., which are listed in the box.

## ● Elevation Expedites Cleaning ●

When washing trucks, it's very desirable to have them elevated. This is accomplished two ways, either by raising the truck on a lift, or running it on tracks over a pit. With the truck to be washed in an elevated position, there is no necessity for the washer to stoop when washing the running gear. If pits are employed the washer works from the pit floor when cleaning running gear, climbing out on the regular floor when working on body sides and top. If lifts are used, it is necessary to provide a platform if the body and running gear are to be washed at the same time. In addition the platform facilitates washing the top.



## ● Washing Equipment for a Single Wash Stand

Car washer  
 Rack, lift or pit  
 Sponges (4)  
 Chamois (4)  
 Rubber squeegee  
 Rubber aprons (2)  
 Valve for cleaning solution  
 Long handled water brush  
 Rubber squeegee  
 Fender brush (2)  
 Wire wheel spoke brush (2)  
 Vacuum cleaner  
 Hub with wringer  
 Brake pedal depressor  
 Spray gun  
 Flood light  
 Whisk broom (2)  
 Soap (barrel)



**I**F, in your shop, no mechanic ever borrows a tool from another, mechanics do not go to the stockroom for tools which should be in their own kits, there are no feeler gage sets with broken .002 in. leaves, all socket wrench sets are complete, no chisels require reworking, each mechanic has all of the tools necessary to work upon a new model which was unloaded yesterday—you should erect a bronze marker at the entrance to your shop that passersby may pause and do homage.

There is a constant shortage of hand tools in most shops despite the fact that mechan-

ics, foreman, service manager and the boss, whether he be fleet owner, dealer or factory branch manager, agree that hand tools have an important bearing on shop efficiency. All intend to have hand tools enough for each mechanic and every job. Some fall a little short of this ideal, some fall far short of it.

Keeping the supply of hand tools in a shop up to standard calls for constant vigilance on the part of shop management. Tools are lost, broken or worn out, new tools and improved designs are coming on the market and changes in truck design require different equipment. It is difficult enough to keep track of all the hand tools in a shop to insure prompt replacement of those lost or rendered unfit for use.

# ENOUGH HAND TOOLS

But It Should Have Because  
Maximum Earning Power  
of Mechanics Depends on  
a Complete Assortment

Service managers have so many problems to meet in managing shops that they find little time to devote to the question of hand tools.

Hand tools vary greatly in design but all have the common purpose of increasing the ability of a mechanic's hand to perform the various operations which comprise truck maintenance. An open-end wrench is simply a lever which enables a mechanic to exert a greater pressure on a bolt or nut. A socket wrench likewise is a form of lever. Hammers, chisels and drifts make use of momentum for striking hard blows. In another class are cutting instruments such as hacksaws and files which provide a cutting edge which is pulled or pushed directly by hand power. Taps and dies are examples of tools which embody cutting edges and leverage.

#### ● Tool Design ●

ALTHOUGH the mechanical principles incorporated in hand tools are simple, their application to actual design of tools calls for a high order of engineering and inventive ability. Proper balance of a hammer is determined by calculation and experiment, relationship is established between size of opening in an open end wrench and its length, handles for various tools are shaped to give a good grip and to be comfortable.

Manufacturers of hand tools have developed many ingenious devices for overcoming difficult jobs. Some of these are applicable only to specific jobs on certain models and come under the classification of special tools, discussed elsewhere in this issue. However, many of them are of wide application in repair work. For ex-

#### How WELL ARE You EQUIPPED?

Battery tools	Knives, putty	Screw extractors
Body tools	Lubrication tools	Shears, metal
Brake tools	Oil cans, hand	Soldering iron
C clamps	Penknife	Spreader, spring
Chisels, cold	Piston pin inserter	Tap and die sets
Compressors	Pliers	Taps, pipe
Piston ring	Point file or stone	Thread chasers
Valve spring	Precision tools	Tool boxes
Cutters	Pry bars	Torch, blow
Bolt	Pullers	Trimmer's kit
Gasket	Bushing	Tubing flaring tools
Drifts	Cotter key	Valve keeper tools
Drill sets	Punches, Center	Valve lifter
Drills	Reamers	Wire terminal tools
Breast	Adjustable	Wrenches
Hand	Expanding	Adjustable
Engine tools	Straight	Box end
Fender tools	Taper	Hub cap
File cleaner	Saws, hack	Open end
Files	Scissors	Pipe
Hammers	Scrapers	Socket set
Ordinary	Bearing	Spanner
Sledge	Carbon	Stud bolt
Soft	Screw drivers	

ample, devices shaped like pliers have been designed for inserting slit-type valve spring keepers. It is very easy to drop these keepers and, as the valve gallery in many engines is open at the bottom, the keepers rattle down into the crankcase. Special hub cap wrenches and lamp rim wrenches are other typical members of this group.

A complete kit of hand tools comprises a surprisingly large number of items. It is very difficult to check over a kit of tools from memory and many shops have compiled written lists of hand tools which should be included in a mechanic's kit. In addition to the tools found in mechanics' tool boxes, other hand tools are kept in the shop toolroom or stockroom.

Although it is easy to classify a  $\frac{3}{8}$ -in. open-end wrench as a part of a mechanic's kit and a socket wrench for a rear axle shaft nut as belonging to the toolroom,

there are many tools which are within the border line between tool box and stockroom.

A service supervisor, who made a study of calls on the stockroom for tools and time spent by mechanics in front of the stockroom window, found out that calls for one socket wrench, which was a size larger than the largest in mechanic's kit, caused a large waste of time. He bought one of the sockets for each mechanic and issued them on memo receipt.

Mechanics and shop owners have a joint responsibility to see that hand tools are available for jobs coming into the shop. Because the need of hand tools is so obvious, the question frequently does not receive the attention it deserves. Lack of a single tool on one job may cost more than the tool itself is worth and delay completion of the work. Time spent in maintaining an adequate inventory of hand tools will pay large dividends to any shop devoting thought to the task.

# LATHES TURN SLEWS

Some of the Many Jobs  
That Are Just "Whoopee"  
to a Lathe—

## GENERAL OPERATIONS

Turning	Tapping
Drilling	Reaming
Boring	Lapping
Grinding	Polishing
Threading	

## SPECIFIC OPERATIONS

### BUSHINGS

Drilling out center before boring  
Truing inside by boring  
Threading inside or outside  
Polishing inside and outside  
Lapping  
Reaming

### BEARINGS

Testing main bearing journals  
Truing main bearing journals  
Testing crankpins  
Truing crankpins  
Reaming wrist pin bearings  
Boring connecting rod bearings  
Filletting ends of rod bearings

### ELECTRICAL

Testing armature shafts  
Straightening armature shafts  
Truing armature commutators  
Undercutting mica  
Making armature center holes  
Restoring center holes

### SHAFTS

Testing bent driveshafts  
Truing bent driveshafts  
Threading driveshafts  
Threading axle shafts  
Squaring end of shafts  
Centering shafts  
Static balancing of shafts  
Testing crankshaft straightness

### PISTONS

Machining pistons  
Polishing pistons  
Machining ring grooves  
Truing warped pistons  
Lapping pin holes  
Reaming piston skirts

### VALVES

Refacing valves  
Truing valve stems  
Straightening valve stems  
Testing angle and trueness of faces  
Truing valve tappets and rockers

### WHEELS

Making mandrels and adapters  
Testing and truing hub flanges  
Reducing felloe size of new rim  
Testing balance of assembled wheel  
Balancing assembled wheel  
Truing all sizes of flywheels  
Cutting teeth off flywheels  
Balancing flywheels

### DRUMS

Testing brake drums for trueness  
Truing drums  
Resizing drums for liners  
Removing scores from drums

### GENERAL

Making emergency parts  
Truing clutch disks  
Making taper and cone adapters  
Making fiber washers  
Making dies and punches  
Boring connecting rods  
Cutting and facing ends of bars,  
tubing and pipes  
Grinding spiral, straight, taper,  
valve seat, and expansion reamers  
Grinding pistons and valves



**E**D WYNN, the delight of theatregoers, once used an assortment of hats to depict characters of the day. Appearing as a collegiate, with skull cap jauntily perched on his head, he would dodge behind a screen for a moment and reappear as a dignified minister under a wide, flat-crown "skimmer." Another change and a shining black topper graced his head as a grafted. Then a brown derby revealed the politician. Then a track fan, a cop, judge—all passed in rapid review as the versatile comedian titillated his audi-

# OF JOBS INTO PROFIT

## Apply Circular Cutting in Eight Different Ways to Every Branch of Maintenance

ence. One person with a few odd hats and several facial expressions became many persons.

It's that way with a lathe. It's a single piece of shop equipment which, with a few attachments, becomes many tools.

The lathe is the most versatile of all machine tools. With very little equipment and ordinary mechanical knowledge and skill a mechanic can use a lathe in the performance of hundreds of jobs around the service shop under the general classification of turning, boring, drilling, grinding, lapping and polishing, threading, tapping and reaming.

### • General Construction •

WHILE there are variations in size, type and design, the fundamental construction of all lathes is similar, embodying a bed, carriage, head stock, back gears, tail stock and lead-screw gearing. Capacity is expressed by swing, which is twice the distance between the lathe centers and the bed, by the length of the bed and by the maximum distance between head and tail stock centers. To increase swing capacity, some lathes are constructed with blocks between the head and tail stocks and the bed. Other lathes increase the swing several inches by providing the bed with removable blocks or bridges as long as 10 in. in one or more sections at a point just to the right of the head stock center. If it is desired to carry a larger piece of work than the lathe would ordinarily accommodate, the blocks can be removed, thus increasing the distance to the depth of the gap in the bed. When the lathe is used for ordinary purposes, the bridges are replaced. Lathes so equipped are termed gap bed lathes.

Material to be worked is supported parallel to the bed between the centers of the head and tail stock. The tail stock's function is to support, while the head stock supports and drives. Drive is transmitted to the work through a face-plate, a face-plate and dog, or chuck, choice depending on size or shape of work. The plate method is employed when working on flat pieces, pieces with holes, short, round pieces, pieces to be turned off center, etc. These are bolted to the plate direct. The plate and dog method is mostly employed when working on rods and bars or with mandrels. All these pieces must have center holes. When using this method the dog is slipped over the material, which is then mounted between the lathe centers, and after the prong of the dog is inserted

in one of the slots of the face-plate, a set screw in the dog is turned down firmly on the material. The chuck is used when working with relatively short pieces, pieces of large diameter, irregular-shaped pieces, pieces providing short grip space, when working off center and, if the head has a hollow spindle, to support working ends of long rods. Chucks have the appearance of a drum, but are solid and carry three or four adjustable jaws on the face side for gripping the work. Jaws may be moved independently or simultaneously through gearing. Independent action is necessary for mounting irregular work and simultaneous adjustment expedites centering round pieces.

Variation in speed of work is obtained by step and back gearing pulleys in the head stock. The pulleys, driven by belt from line shafting or motor, permit the lathe to be operated at high speed, with the belt on the smaller steps for finishing, drilling and polishing. The larger steps provide intermediate speeds for general work. The back gears furnish the slow speeds and power required for heavy roughing cuts. Reverse levers for changing direction of the automatic feeds are also provided in the head stock.

### • Tool Mounting •

THE main support of all cutting tools is the carriage, which straddles the two ways of the bed and is propelled longitudinally by a hand wheel or automatically by a lead screw, which runs almost the full length of the lathe. Cross-feed is provided by a part mounted on the carriage known as the apron, which in turns carries a tool-supporting unit designated as the compound rest, also equipped with a screw feed. The cross-feed of the apron and the compound rest screw feed permit the operator to do all kinds of straight or taper work, because in combination these two screws allow the cutting tool to be fed in any direction. Most compound rests have graduations in degrees reading from 0 to 90 deg. from center to each extremity of the arc for clamping at any angle desired. Screw feeds generally, whether in carriage, apron or compound rest, have micrometer graduated collar readings in thousands of an inch for precise settings.

Automatic cross and longitudinal feed are controlled by the lead screw, which is connected to

TURN TO PAGE 48, PLEASE

# HOISTS AND JACKS LIFT WEIGHTS EASILY

HERE is considerable lifting to be done in the every-day working routine of a repair shop. Rear ends are raised for axle work; front ends for steering gear and wheel adjustments; all ends for tire and brake service; bodies and cabs are removed for replacement, repainting or preliminary to general chassis overhaul; engines are hoisted bodily out of frames and transferred elsewhere for major repair; transmissions are dropped or lifted into place, etc.

Fortunately, all kinds of equipment are available to lighten these otherwise dangerous and sweat-producing jobs, which are preliminary to actual repair work. While all serve the same common end—elevating—they go about it differently. Jacks, braced from below, do their act by pushing; chain hoists accomplish the same objective by lifting from overhead at the same time leaving floor space below clear; floor cranes possess the characteristics of both, pushing down on the floor like a jack and lifting from above like a hoist, and a distinct characteristic of its own, that of being capable of being pushed over the floor.

#### • Safety for Men and Work •

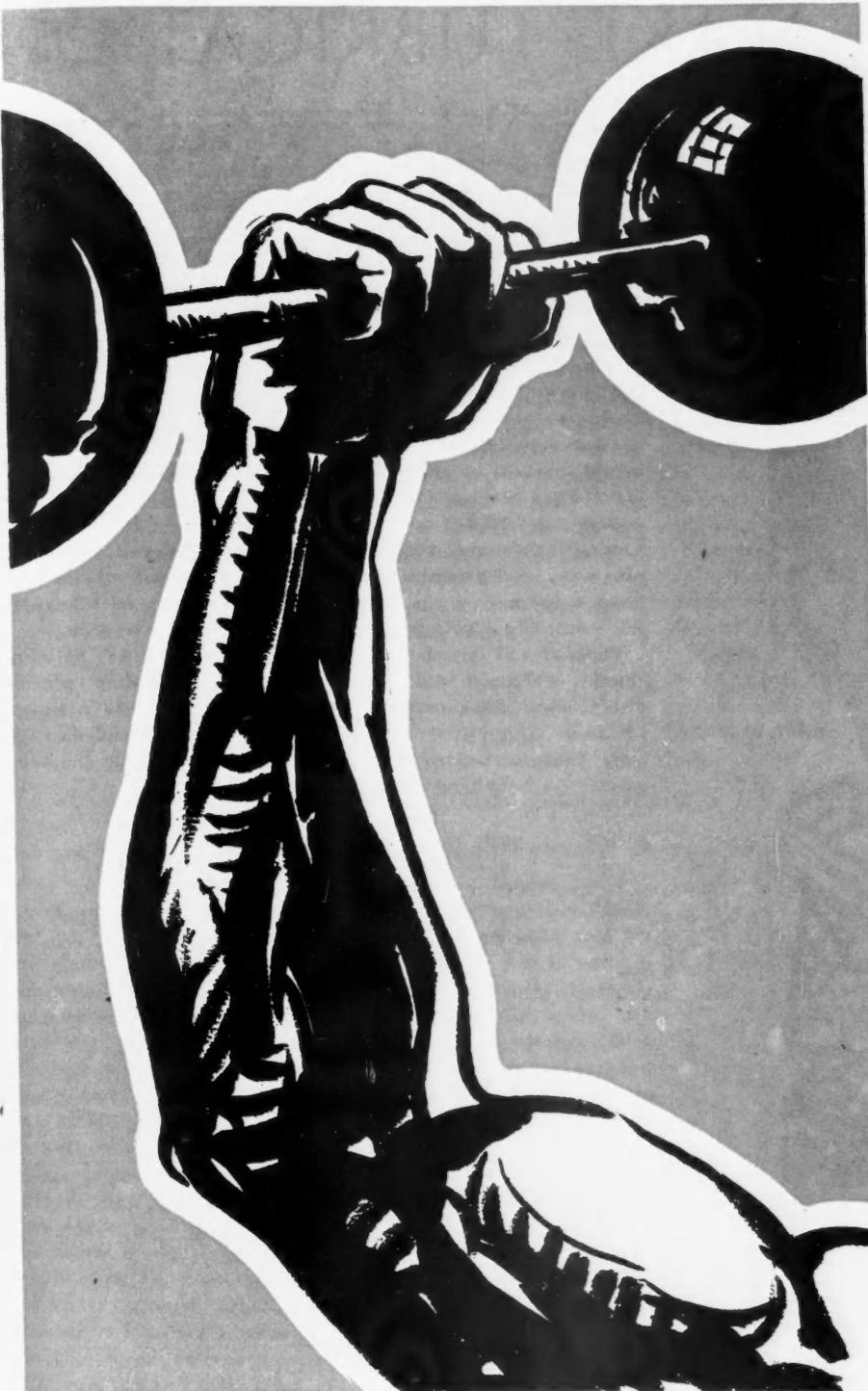
Unfortunately, many otherwise well-equipped shops are inadequately supplied to meet all of these different lifting needs. Aside from the fact that shops properly equipped with lifting devices profit because of greater efficiency and time saving, there is another and more important reason why shops be properly equipped—and that is, safety. Not an infrequent sight in some shops is the primitive use of blocks of wood, boxes and other makeshift devices to support rear or front ends of vehicles and even in some cases engines. These were probably raised on their precarious perches by the jack and block method and bolstered up as the lift increased. These methods are crude and dangerous to life and limb. And aside from the personal element may result in costly damage to the unit being supported should the bolstering collapse.

Many developments have occurred during the last few years in vehicle design and

maintenance demands that have increased the importance of lifting devices in the shop. Probably the most outstanding is the almost universal adoption of four-wheel brakes, and as a consequence brake inspection and service represents no small proportion of shop work. In modern brake work vehicles are raised off all four wheels and to expeditiously render such service shops must be fully equipped with jacks. With the growing recognition by operators of the importance of periodic lubrication, sales in this department of service also has shown a considerable increase. To meet the demand and encourage patronage, alert service executives are installing lifts to speed up this service.

More attention is being given to the subject of removing and replacing engines. One of the reasons for the interest in this plan is the exchange unit plan, which has been developed to reduce idle time of vehicles going under repairs. Another reason is that in some cases time can be saved by removing an engine for jobs ordinarily done with the engine in the chassis. The so-called "top overhaul" of engines comes in this category. Some time is spent, of course, in removing, but it is the opinion of many servicemen that this loss is ultimately compensated for in time saving on the actual repair. Where these maintenance methods are pursued something more than purely lifting devices are necessary. After the lift comes the need for moving the unit to the place of repair.

A chain hoist, combination overhead track system, and chain hoist or portable crane is the answer. If the first method is employed the vehicle is maneuvered until the unit to be removed is immediately under the chain hoist. The unit is then lifted out, the chassis



## They Safely Speed Up Modern Service

### Types of Weight Handlers

#### JACKS—

**Method of operation**  
 Mechanical  
 Hydraulic

**Types**  
 Garage  
 Floor  
 Special high lift  
 Special low clearance

**Attachments**  
 Truck wheels  
 Transmissions  
 Rear axle

#### HOISTS—

**Types**  
 Chain  
 Air  
 Electric

#### CRANES—

**Types**  
 Industrial truck  
 Floor type  
 C-frame  
 A-frame  
 Overhead  
 Monorail  
 Duorail

#### LIFTS—

**Types**  
 Hydraulic  
 Mechanical  
 Pneumatic

is pushed out of the way and an engine stand is placed beneath the suspended unit upon which it is lowered. After the engine is lifted out of the frame, in shops where the overhead track system is used, it can be moved throughout the extent of the track without lowering to the floor.

Portable cranes, of course, can be moved anywhere. In monorail installations the overhead track is usually carried over the engine department so that the units can be placed in engine stands.

In some cases it is desirable to be able to move the hoist in two directions, crossways of the building as well as lengthwise. This is accomplished by means of an overhead

TURN TO PAGE 48, PLEASE

# HOW TO MAKE LUBRICATION SERVICE A PLEASURE



## What you need for rendering lubrication service—

Lift, rack or pit	Open end wrench set
Lubricating outfit for pressure fittings	Adjustable end wrenches
Lubricating outfit for transmission and differentials	Pry bars
Hand lubricating guns for pressure fittings	Stillson wrench
Hand oil and grease guns	Hub cap wrench
Oil measures, 1 pt., 1 qt., 2 qt., 10 qt.	Chisels
Gearcase busher	Screw drivers
Spray gun for penetrating oil	Files
Funnels (assorted)	Pliers
Oily waste pan	Screw extractors
Hand oil can	Hammer
Drain bucket or pan	Magnet
Socket wrench set	Drop lights
	Flash lights
	Flood lights
	Fender covers
	Pressure boosters

ONE of the first requirements of preventive maintenance is lubrication, regularly and thoroughly done. Operators generally have accepted this tenet and are either equipping their shops to properly fulfill the lubricating needs of their vehicles or are turning to the dealer or independent quick service establishments to provide the service. As a result lubrication service has become one of the most important of quick service operations. Money is to be made in rendering this service if properly managed and service stations equipped with high pressure lubricating outfits, greasing racks and other equipment necessary in the handling and dispensing of lubricants can profitably augment their regular line of service sales.

To meet the expectation of operators, trucks must be lubricated quickly and well. Speed is also an essential in reducing direct labor costs and overhead expense to insure adequate profit at competitive prices. In order to accomplish these ends, equipment must be chosen and laid out to do the work quickly and without sacrificing quality.

### ● Choose With Care ●

When selecting equipment, probably the first thing to be considered is whether lifts, racks or pits are to be employed. Of the three forms of elevating the truck, probably the pit method is the least common because such installations are generally provided in the original design of the building and are rarely installed later on account of cost and renovating disadvantages. Properly equipped pits, however, have built into them pipe lines and outlets, located at convenient points, and fed from a stationary high pressure lubrication plant. Portable lubricators, however, are better adapted to rack and lift installations. While there are a number of different makes of the portable type lubricator, there are two general types, namely, air and electric. The air type outfit embodies a pump which resembles a miniature steam pump, having a double acting piston for air and a single acting plunger for grease. In this type, the lubricant is kept under pressure in the line and is released immediately upon opening of the valve in the injector. The pump starts automatically, maintaining an even pressure in the line. The electric type does not actually have pressure on top of the nozzle, but builds it up immediately when snapping a switch which starts a motor and pump.

In addition to the power lubricators, hand operated

TURN TO PAGE 52, PLEASE

January  
January  
February  
February  
March.  
March.  
April.  
April.  
May...  
May...  
June...  
June...  
July...  
July...  
August.  
August.  
8 Mont

The C



## THE TRUCK INDUSTRY- FIGURATIVELY SPEAKING

ALTHOUGH domestic sales in August this year, according to the statistics below, dropped 34 per cent under the total for August, 1929, which from a percentage standpoint represents the low mark of the year, returns for September, complete at the moment of going to press, reveal a distinct betterment in conditions. Sales for September totaled 33,933 as against 46,561 for September of 1929, a drop of 27 per cent. For the first time since the first of the year domestic sales for any month showed a decided improvement over the preceding month, with the exception of June, which was a little better than May. An encouraging note is also contained in the fact that total sales

for September exceeded August slightly.

While September was the lowest month of the year from the standpoint of unit production it is gratifying to note, according to the truck production table below, that the total lined up better, with the 1929 figure being only 18.9 per cent under. This compares with a drop of 35.5 per cent for the previous month. Unit export estimates for September also show an improvement, comparing better with September export sales of a year ago than August. Export estimates for October not only continue to show improvement in comparison with 1929, but also show an increase in unit sales over August of 1930.

### Domestic New Truck Registrations by Makes and Months

	Autoar	Brockway-Indiana	Chevrolet	Diamond T	Dodge	Fageol	Fargo	Federal	Ford	G. M. C.	Gottfredson	International	LaFrance-Republique	Mack	Moreland	Relay	Reo	Ruby	Schaeft	Selden-Hahn	Sterling	Stewart	Studebaker	White	Willys-Overland	Total Sales Including Miscellaneous
January.....1930	160	249	8,754	242	1,608	41	186	169	13,233	727	12	1,835	43	345	51	28	698	90	21	30	145	97	104	413	440	30,241
January.....1929	135	249	6,169	302	2,368	71	169	204	13,019	1,178	43	2,158	43	372	60	52	830	73	5	14	101	113	121	412	255	29,375
February.....1930	135	235	10,332	207	1,269	43	152	162	14,008	552	4	1,928	44	298	29	30	565	67	20	23	74	155	91	320	431	31,882
February.....1929	129	247	10,288	276	2,009	44	159	190	13,313	1,022	28	1,939	68	388	62	39	830	73	5	9	87	134	93	339	316	32,565
March.....1930	195	384	13,011	264	1,595	48	157	228	19,551	936	10	2,364	55	452	56	45	682	62	27	16	106	265	102	407	559	42,182
March.....1929	230	410	16,062	370	2,632	73	244	262	17,797	1,330	22	2,526	52	752	70	47	1,240	87	25	21	113	172	210	508	455	46,348
April.....1930	216	492	14,055	300	1,684	52	153	252	21,757	1,242	7	2,740	71	566	57	61	903	47	47	24	147	314	98	480	564	47,032
April.....1929	368	518	18,175	352	3,054	111	239	286	22,790	1,576	16	3,425	52	852	83	121	1,475	101	29	33	157	244	159	622	474	56,278
May.....1930	212	544	12,825	373	1,504	59	152	213	19,758	1,191	14	2,531	49	717	36	93	737	59	55	20	147	305	115	452	456	43,245
May.....1929	335	462	15,965	350	2,847	78	272	326	22,364	1,453	12	3,234	150	740	62	76	1,547	125	38	31	165	242	149	621	439	52,875
June.....1930	183	481	9,761	261	1,113	56	118	158	15,669	889	5	1,917	56	446	29	43	581	54	38	22	109	207	102	412	352	33,512
June.....1929	229	377	13,234	307	2,418	79	280	229	19,528	1,315	6	2,698	51	694	58	65	1,222	97	33	19	157	171	153	505	474	45,075
July.....1930	194	388	10,947	338	1,080	47	124	209	19,841	882	8	2,477	50	577	39	41	583	71	43	11	104	262	88	460	409	39,888
July.....1929	306	571	18,056	318	2,815	104	478	275	24,503	1,469	17	3,741	48	692	86	56	1,326	132	17	40	177	254	175	564	969	57,946
August.....1930	171	251	9,544	277	707	32	91	142	17,086	604	3	2,223	51	405	33	27	436	72	26	19	102	184	85	399	295	33,758
August.....1929	263	436	16,651	362	2,262	63	396	235	22,405	1,274	4	3,188	70	646	61	72	1,212	135	24	31	176	255	116	598	841	52,540
8 Months.....1930	1,466	3,024	89,229	2,262	10,560	378	1,133	1,533	140,903	7,023	63	18,015	419	3,806	330	368	5,185	522	277	165	934	1,789	785	3,343	3,506	301,740
8 Months.....1929	1,995	3,270	114,600	2,637	20,405	623	2,247	2,007	155,719	10,617	148	22,909	534	5,136	542	528	9,798	853	176	198	1,133	1,585	1,176	4,169	4,203	373,002

### Truck Production

(U. S. and Canada)

	1930	1929	% Loss
January.....	40,189	57,765	-28.1
February.....	51,984	65,950	-19.1
March.....	67,769	79,587	-12.9
April.....	70,945	91,955	-21.6
May.....	57,791	94,940	-39.0
June.....	48,669	98,164	-50.4
July.....	41,296	78,703	-47.5
August.....	38,606	59,985	-35.5
September.....	44,309	54,683	-18.9
9 Months Actual.....	461,558	681,732	-32.3
October.....	45,000*	66,235	-32.0
10 Months Estimate....	506,558	747,967	-32.2

\* Estimate

### Foreign Truck Sales

(Comprise Exports, Foreign Assemblies and Canadian Production)

	1930	1929	% Loss
January.....	21,879	23,119	-5.4
February.....	22,047	30,905	-28.7
March.....	21,888	39,872	-45.2
April.....	22,485	33,378	-32.4
May.....	20,709	28,833	-28.2
June.....	16,339	32,176	-49.2
July.....	10,747	35,623	-72.0
August.....	13,231*	29,120	-54.4*
September.....	11,634*	23,084	-49.6*
October.....	13,300*	23,505	-43.4*
10 Months Total....	174,259*	302,620	-40.7*

\* Estimate

# PRESSES HELP SHOPS WIN WITH THE "SQUEEZE PLAY"



## PRESS TYPES, SERVICES AND FIXTURES

<b>TYPES</b>	Riveting Ring gear Transmission cluster gears
Floor	Compressing Clutch springs Chassis springs
Bench	Broaching Bushings
Pedestal	
<b>METHOD OF OPERATION</b>	
Hydraulic	FIXTURES
Mechanical	V-blocks Truing fixtures Truing gages and stands Test blocks Riveting fixtures Straightening fixtures Pressure plates Pressure clamps for supporting shafts vertically Puller clamps to support small ball races, gears, etc. Spring compressing fixtures
<b>SERVICES</b>	
Pressing (on and off)	
Bushings	
Bearings	
Gears	
Sleeves	
Pins	
Wheel hubs	
Drums	
Straightening	
Shafts	
Housings	
Drag links and other parts	
Disk wheels	
Clutch backing plates	

November, 1930

EVERY shop needs a press. Bushings, bearings and sleeves become stubborn and need persuading; shafts and housings balk at ordinary manual methods of straightening submit only to strong arm methods and innumerable other little obstinacies crop up in the every-day routine of repair shops which would greatly hamper the mechanic if a press were not available.

The press is truly an indispensable item of shop equipment as the large list of operations in the accompanying box clearly indicates. Not only does the press conserve human energy and time in driving things in and out of parts and in straightening and bending operations, but serves in a number of other operations, which otherwise would be difficult if not impossible to accomplish.

Equipment manufacturers familiar with the needs of the shop, are offering presses which incorporate brute strength with delicate control, handling convenience and provisions to extend scope of work which will effect important savings in time and labor.

### • Wide Pressing Range •

PRESSES derive their powerful leverage through hydraulic or mechanical means and are classified accordingly. They are further classified as either floor or bench types. Floor press capacities generally range from 10 to 80 tons and are made in table or bolster widths of from 32 to 42 in. Both hydraulic and mechanical type floor presses incorporate features for quick handling of work and applying easily various degrees of pressure. On the hydraulic type, adjustments in leverage and length of stroke are made on handle to suit the convenience of the operator and the work to be handled. By this adjustment, quick travel or extreme pressure can be developed easily.

Mechanically operated presses usually embody a hand wheel and screw for bringing the ram quickly into contact with the work and one or more levers for exerting extreme pressures. The hand wheel alone generally develops 3 to 5 tons. If greater pressures up to 50 and 60 tons are desired, heavy duty levers are thrown into engagement with latches on the hand wheel. To speed up work, some companies provide adjustments in the levers to suit requirements of the job. If high pressures are not necessary, the lever may be adjusted for lower pressures and quicker operation. Tables for holding work are raised or lowered by crank and screw or crank and bolt. In the former type the bolster is supported on two upright screws. The bolster is caused to travel up and down the screws by a crank and chain arrangement. In the latter

TURN TO PAGE 52, PLEASE

The Commercial Car Journal

# GRINDERS KEEP OTHER SHOP TOOLS ON EDGE

## Attachments Extend Scope of Service

Types	Attachments
Bench	Brake lining grinding
Pedestal	Buffers
Portable	Drill sharpening
Internal	Drum
External	Eye guards
	Exhauster guards
	Polishers
	Special wheels
	Tool rests
	Tool shelves
	Water cups
	Wire brushes

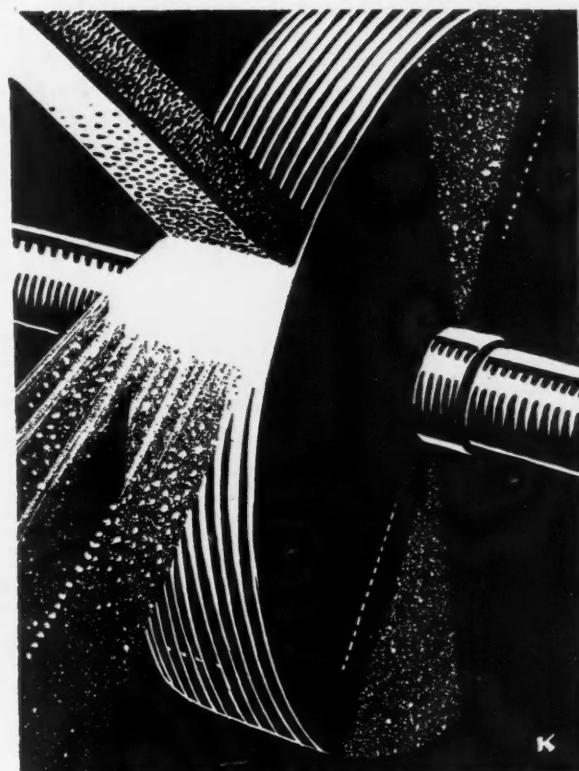
Method of Operation	
Electric	
Line shafting	

CUTTING edges of tools become dull and battered and require sharpening, parts may be oversize and need trimming, castings and cuttings may have sharp burrs that must be removed, arc and gas welds form welts that need dressing, surfaces need to be roughened, others need to be buffed and polished, etc. These are but a few of the many ordinary grinding needs which arise daily in truck maintenance routine. Then there are special needs such as grinding centers, internal grinding of small parts, grinding pins, etc., removing paint from bodies, as well as ordinary grinding and polishing operations on large pieces of work.

To meet most of the ordinary grinding requirements, the bench or pedestal type of grinder with one or two driving spindles is usually employed. Drive generally is by electric motor, the rotor shaft of which also serves as the spindle or spindles and extend only a few inches from the side of the motor housing. General-purpose grinders, deriving their power from line shafting, are generally of the pedestal type, the stand and grinding element forming an integral unit. The driving shaft in this type of grinder is supported in a yoke on the top of the pedestal, with tight or tight and loose pulleys mounted on the shaft between the bearings in the yoke ends for drive instead of a motor as in the electric type. Pedestal type grinders are employed by many shops because they can be located anywhere in the shop at points convenient to the workmen.

### ● Tool Sharpening Jigs ●

GRINDERS are furnished with attachments, as standard or extra equipment, for supporting material being ground, standard and special tool rests, water cups and basins, tool



shelves, brake lining grinding fixtures, various size grinding disks and buffers. Many grinders are also supplied with attachments for supporting drills when sharpening, in which case the standard tool rest is swung out of position and replaced with the drill holder.

Some of the regular line bench or pedestal grinders are adaptable to special needs, being furnished with special shaft extensions to permit free and unhampered application of work to buffing and polishing wheels. However, special grinders are originally designed with long extensions from the motor housing for this purpose. These grinders are particularly useful in tire work for roughening surfaces besides general buffing and polishing.

Another type of grinder useful in a wide range of services in the shop is the portable electric grinder. It is a self-contained power unit embodying a motor, spindle for wheel, guard and working grip or handles. All work cannot be carried to the grinder but, like Mahomet and the mountain, the grinder can be brought to the work. This is the principal advantage of the portable grinder. Another is its flexibility; the grinding wheel can be applied to the work at any angle and from various positions. Its large range of services include removing paint from bodies, touching up springs and other chassis parts, dressing off

TURN TO PAGE 60, PLEASE

## HOISTS AND JACKS LIFT WEIGHTS EASILY

CONTINUED FROM PAGE 43

crane with a rectangular frame mounted on two overhead tracks spaced as far as the desired crosswise movement. The hoist can be moved from one to the other of the rectangular frames and the two can be moved from one end of the track to the other. This arrangement makes it possible to pick up or deposit an engine anywhere within the area inclosed by the overhead tracks. Equipment of this character is not only confined to the movement of engines, but can be used to advantage in handling any heavy part, such as transmissions, rear end, wheels, bodies, etc.

Portable cranes, as mentioned, also combine the lifting and moving function. There are several different types of which the double A-frame with a connecting bar and the horizontal U-frame on which is mounted a curved lifting arm may be used as examples. Both types are supported on large wheels or casters so they can be moved about the shop.

Electrical industrial trucks with power-operated cranes have been adopted for this combination lifting and moving function in some shops, especially in large shops where the distance between departments is large and on several different floors. These trucks are equipped with storage batteries which furnish power to move the trucks as well as to operate the winch in the crane.

In addition to the floor and garage jack, the manifold services of which are known and appreciated by all, there are a number of special purpose jacks and jack attachments designed to ease many shop operations. Of the special jacks the high lift and low clearance types are examples. Jacks having lifting ability up to 3 and  $3\frac{1}{2}$  ft. have a wide range of usefulness. They can be used to take the load off springs to lubricate and replace springs; to rebush spring eyes, spring shackles and brackets; to replace spring shackles or frame horns; to install or adjust shock absorbers, snubbers, etc.; to raise or lower crankcase; to lower pan or transmission in removing and replacing; to raise front, rear or side of vehicle for working underneath and in innumerable similar jobs. The constantly increasing use of balloon tires has created a need for special low-clearance jacks with high lifting ability.

Jacks equipped with attachments

have saved mechanics many an arduous hour. The truck wheel attachment is an example. By means of it truck wheels can be removed easily and quickly from the axle and transported to and from the hydraulic press or to the drum truing machine. Other attachments include cradles for transmission and rear axles.

Some shop men have found the jack useful in another service besides lifting by using small floor jacks for pressing operations. To illustrate, a certain mechanic was confronted with the problem of removing a large dent in the straight side of a rear wheel housing. He simplified his task by lying the jack on its side on the body floor between the rear housings, and propping the base with two-by-fours against the opposite side. With the head against the dent he forced it back by raising the head. There are many other similar pressing jobs that can be performed with the jack by the alert mechanic.

## LATHES TURN SLEWS OF JOBS INTO PROFITS

CONTINUED FROM PAGE 41

the head stock spindle through change gears. The distance the carriage moves right or left per revolution of the work is varied by changing the gears in the gear box, which is located at the left end of the lead screw. The same principle applies to the in-and-out motion of the apron. The threads of the lead screw are used only when cutting threads and not for operating the automatic feeds. For automatic feeding, the lead screw serves as a power shaft only, being splined and keyed to a driving worm.

### • Two Drives •

LATHES do their work either by driving the work or driving the tool. In turning operations, work is driven and the tool is stationary; in reaming, the tool is usually driven; in drilling, either the tool or work is driven.

The making of a bushing involves several different operations and is an excellent example of lathe versatility. The example also shows how one job can be completed in one setup, in which case, of course, the work is driven entirely. To make a bushing the following lathe operations are involved: rough turning, drilling, boring, reaming, finish turning and cutting.

When the length of the material from which the bushing is to be made will not permit it to be turned to size in the chuck, the bushing is first bored and reamed and then mounted on a mandrel between centers in the lathe for turning to correct diameter.

However, when the material is of a length permitting the use of the chuck, the bar from which the bushing is to be made is placed in the

chuck and allowed to project far enough to be machined. After the chuck jaws have been adjusted to make material run true, the end of the material is faced and the outside diameter is rough turned to within  $1/16$  in. of the finished dimension. The same tool may be used for both operations, being fed by the cross-feed screw in the apron for facing and the longitudinal feed of the carriage for turning. The next step is drilling in which operation the tail stock and not the carriage is used to support the tool. The drill is supported by a drill chuck placed in the tail-stock spindle. After truing, the material is drilled  $1/16$  in. smaller than the finished size of the hole and  $1/4$  in. longer than the length of the bushing. The drill is then replaced by a tool-post-mounted boring tool, which consists of a cutting edge at right angles to the stem to true up the hole. The hole is finally brought to the correct diameter by a reamer, which replaces the drill in the tail-stock chuck. All the tail-stock tools are fed into the material by the tail-stock hand wheel. The bushing is then ready to be cut off with  $1/32$  in. margin on each end for finishing. After cutting, the bushing is pressed on a mandrel to enable it to be supported for the finishing operations. A lathe dog is attached to the mandrel and the whole assembly placed between centers. The job is completed by turning the bushing and shoulder to the finished diameters and facing the ends to the exact length. If the bushing is an odd size and a mandrel is not available, one end of

TURN TO PAGE 60, PLEASE

# SHOPS WITH COMPRESSORS GIVE HARD JOBS THE AIR



## Put Air to Work on These Jobs

### To operate—

- Door openers
- Lubricators
- Riveters
- Engine hoists
- Vacuum cleaners
- Paint sprayers
- Car washers
- Engine cleaners
- Gasoline dispensers
- Lifts
- Tire changers

### And to—

- Inflate tires
- Clean upholstery
- Remove chips
- Clean fuel system
- Clean parts
- Test radiators
- Flush radiators
- Agitate cleaning solutions
- Remove water
- Test inner tubes
- Draft forges

A SHOP without compressed air is like a carpenter without a saw and shops with compressed air are constantly finding new chores for its profitable application. Compressed air in a shop is a power agent that can be made to serve many useful purposes. In addition to its obvious application in inflating tires, air under pressure is being used largely as a portable source of power for jobs such as operating high-pressure lubricators, garage doors, engine hoists and riveters.

Jets of compressed air are being used in many different ways about shops. The jet may be used directly for blowing dirt off a part or chips away from a drill. Some shops go so far as to provide a compressed air hose and quick-acting nozzle opposite each vise on a work bench and beside each floor drill or lathe. An air jet inside a miniature injector becomes an engine cleaner discharging atomized kerosene at high velocity on engine surfaces.

Spray painting is another application of a compressed air jet. Although spray painting outfits may include a small compressor and air tank, many of them are coupled to shop air lines for their supply of air.

### • How Compressors Work •

Air compressors are similar in general design to truck engines. Crankshaft, connecting rod, piston, ring and cylinder construction are much like that of engines, but the valve gear is quite different. Cylinders take in air on downward stroke of pistons and discharge on upward strokes and automatic valves are quite commonly used for intake and discharge. Drive usually is by electric motor which is connected to the compressor by V-belt, flat belt, gears or directly through a flexible coupling.

Most air compressor outfits are automatic in operation, a pressure control switch turning on the motor when pressure in the tank drops to a certain point and shutting the motor off when pressure reaches a predetermined maximum. To reduce load on the motor when starting against tank pressure, many compressors embody an unloader which allows the compressor to turn over without pumping air until a certain speed is attained.

Greater demands upon air compressors call for the use of larger units. Most shop executives anticipate compressed air needs a bit when selecting air compressors. An air compressor which runs practically all day long to maintain pressure in the system obviously is too small.

# SPECIAL TOOLS THWART "CAN'T BE DONE" JOBS

## Tools Which Take the Trick Out of Intricate

### Bearing and Gear Pullers

Gear pushers  
Gear drivers  
Valve guide pullers  
Combination gear pullers and pushers  
Combination valve guide pullers and pushers  
Sleeve pullers  
Spring bushing tool

### Jigs

Oil trough depth gage  
Timing gage  
Drill locating  
Brake lever locating  
Piston  
Ring gage  
Connecting rod alignment  
Top dead center fixture  
Brake gage  
Universal joint holder  
Clutch assembly

### Wrenches

Spanner  
Stud  
Box  
Offset  
Carburetor

### Handles and Bars

Crankshaft turning  
Flywheel turning  
Connecting rod bending

### General

Valve spring compressor  
Engine and cylinder head lifting hook  
Ring compressor  
Valve spring lifter  
Valve spring keeper tool  
Flywheel housing facing tool  
Special reamers  
Piston pin inserter



CERTAIN jobs defy the utmost efforts of mechanics armed with ordinary tools. A nut may be so placed that no wrench or combination of wrenches can reach it. A "blind" bearing cup may present no surface to which a tool may be attached, a gear may be entirely surrounded by compartment walls, an adjustment may require a given part to be held in a fixed position. For meeting these problems special tools have been devised.

Because so many different special needs arise in truck maintenance, tools to meet them are of almost infinite variety. Some of them are jigs to assist in assembly or to assure alignment, others are variations in standard tools, such as wrenches, to adapt them to unusual tasks, and still others are gages for size, position or alignment.

Truck manufacturers, builders of major units and tool makers devote much time and money to developing special tools. They try to anticipate the service problem in the field and to prepare special equipment in advance. In fact, many factories list the special tools required for jobs enumerated in each service bulletin.

Many special tools now on the market are shop hints which graduated to the production class.

Mechanics, faced with difficult operations, devised special gadgets for the purpose. However, thinking up the idea is only a part of the problem of providing special tools. The idea must be developed into a tool suitable for production. One company spent several months experimenting with tools of the same general design before adopting one pattern for production. The final model was lighter, stronger, cheaper and of more general application than any of its predecessors.

A get-rich-quick promoter who promised a return of 5 per cent a month would attract a lot of attention among investors—and the police. More than a few special tools pay dividends of 100 per cent on their cost each time they are used; practically all of them make large returns.



## WEIGHED - and found economical

So many important factors enter into that final cost.

Consider these two: public favor, that eases sales; and absence of any instrument-adjustment, holding assembly cost at rock-bottom.

Here are two potent factors which securely establish Lockheed Hydraulic Brakes as a *policy* of certain wise manufacturers.

It might well pay others — even in most highly competitive price-ranges — to make the same *weighing* test: final cost at the loading platform against a slightly higher initial price.

Evidence is in concrete form for those who prefer knowledge to guessing.

**HYDRAULIC BRAKE COMPANY, Detroit, Mich., U.S.A.**  
(Division of Bendix Aviation Corporation)

# LOCKHEED HYDRAULIC *Four* BRAKES *Wheel*

## Presses Help Shop Win With "Squeeze Play"

CONTINUED FROM PAGE 46

type the table is supported in the uprights on pins and is raised or lowered by a crank after the pins are removed. When the table is brought to its desired position, the pins are reinserted in another set of holes, supporting the table in its new position.

Bench presses, of course, are smaller than the floor type and are intended for lighter work. Some manufacturers build a bench-type press into a floor press as an auxiliary unit. Unlike the floor press, bench types generally have the form of an upright "C." The "C" has a screw and ram in the upper leg and a forked base in the lower supporting plates and other fittings. Bench presses range in capacity up to 10 tons.

Fixtures to be used with the press have greatly extended the utility of this item of equipment. Among them are: truing fixtures and gages for straightening operations, V-blocks for supporting shafts, etc., along the press table, surface plates, riveting fixtures, special vises for supporting shafts in a vertical position, puller clamps for supporting small races, gears, etc., pressure plates, arbors, and brake and transmission reliner fixtures.

## Slick Devices Lay Tire Troubles Flat

CONTINUED FROM PAGE 33

Spot repairing is becoming more and more popular these days of greater tire care. Small side wall and tread cuts repaired in time greatly increase tire mileage. The job isn't costly and can be quickly done with proper equipment. After preparing the cut and filling with gum the wound is cured in machines such as described above. Other machines available for spot repairing embody metal heaters for both in and outside the casing.

Tire repair shops frequently have occasion to straighten kinks in all types of rims, including clincher, straight-side removable ring and split solid type. Anvils having various grooves and faces, flat, convex and concave, are available and greatly simplify this operation. By means of it, lock rings can easily be opened, kinks taken out of rims, lock mechanism repaired, etc.

Hot or vulcanizing plates for tube repair work save time and secure efficient work. These plates are heated by steam developed either by gas or gasoline and may have temperature regulated automatically by thermo-

stats. As the name indicates, this device consists of hot plates over which the tube to be repaired is placed and held down firmly by clamps. Various sizes are available to take care of small cuts or rips as long as 2 ft. and to handle several tubes at the same time. Water tanks are necessary to locate tiny punctures which ordinarily escape the eye or ear.

The press is probably one of the most important items of equipment in solid tire repair work because without it old tires could not be removed from rims nor new ones replaced. The tread groover and tread cutter also are tools frequently employed when working with solid tires. The tread groover is a portable machine for cutting grooves in treads that have worn bald. The device operates much like a pneumatic hammer or like a saw. When solid tires wear out of round, cutters are used to remove the high spots and make the tire concentric. The cutting blade of this tool is stationary and is moved up against the wheel, being revolved by the truck engine.

## Make Lubrication Work a Pleasure

CONTINUED FROM PAGE 44

pressure grease guns are useful for handling special lubricants. A booster for cleaning out clogged pressure fittings and bearings is also a useful and necessary device.

Beside the lift or rack, and equipment needed in handling and dispensing lubricants, tools for removing drain plugs from crankcases, transmissions, differentials and drain pans are very necessary accessories. Gear case flushers for cleaning the inside of housings also are very helpful. There are types on the market which have taken the grime and disagreeableness out of this operation by performing the job without the necessity of getting "all greased up."

Pry bars are of considerable assistance in taking the weight off spring bolts so that lubricant can be forced through. Hub wrenches of the universal type save considerable time when removing hub caps. Flash lights and drop lights are a necessary aid in locating various fittings, and supplement use of flood lights. Use of guns for spraying chassis springs results in quiet-running vehicles and satisfied customers. Fender covers assist in keeping vehicles clean and promote good will. While pressure fittings are not items of equipment, an assortment of these conveniently at hand are very helpful in case some are missing on the truck being lubricated.

## When a Body Has a Body to Repair

CONTINUED FROM PAGE 21

A whole family of tools is available for body repairs. There are trimmer's kits for upholstery; saws, planes, chisels and knives for woodworking; spray paint outfits, buffers, touch-up kits and brushes for painting, and large tools for bending, straightening and forming body panels.

Body panels are removed for making extensive repairs, and sometimes must be removed for even minor jobs. Deep circular dents, previously mentioned, require removal of the panel unless it is quite accessible on both sides of the damaged section. The dent is taken out by heating the sheet with a welding torch and hammering in a circular path around the raised area. Welding is also used for tears in sheets and fenders.

Final finishing of sheet metal repairs calls for smoothing in various ways. Portable grinders, wire brushes and buffers apply power to the undertaking. An ordinary file is useless for dressing a concave surface, but that does not prevent mechanics from filing on such inward curved surfaces. Half-round files are made for the job and flexible files or rasps which may be formed to the desired curvature also are used. Both types of curved files meet the need of filing a space in the center of a wide, flat sheet, as in a body panel.

In these days of de luxe equipment and good-looking commercial vehicles a cracked windshield or ripped seat cushion attracts as much attention as a valve click. Many mechanics dread glass or upholstery work, fearing that they will break new glass or fail to do a neat dressmaking job on upholstery. Tools help to overcome this feeling by making these jobs easier. A mechanic wearing a pair of leather gloves with finger tips cut out and armed with a glass-removing tool undertakes removal of a broken windshield without misgivings. A magnetic hammer sweeps aside the inconveniences involved in driving tacks of almost microscopic size.

Squeaks and rattles are no more welcome in a modern truck than in passenger cars. A dry hinge renders an unwelcome selection; a broken door lock produces a rattle no more popular. For all of these odd jobs suitable devices are made. Oil cans are supplied with spouts incorporating bends and twists, pressure devices squirt the oil to out-of-the-way places. Routine maintenance of bodies and cabs has not been overlooked by tool designers.

**800,000** pounds of fresh cold milk are daily

rushed by truck to Hershey. In 3 hours these trucks

cover as much as 100 miles. That's a lot of speed, but

in the year

since high

pressure tires

yielded place



to Goodyear Truck Balloons not a single tire has failed

because of heat—schedules have been maintained as

never before—tire mileage has shown an outstanding

increase—operating costs have gone down—and on top

of all that it has been possible to add gigantic new tank

units to the fleet, capable of carrying a milk load of

21,500 pounds. How about putting your trucks on

**GOOD YEAR** **TRUCK BALLOONS?**

*The Greatest  
Name in  
Rubber*



*More tons are hauled on  
Goodyear Tires  
than on any other kind*

# "RIGHT DRESS" FRONT END AND SAVE TIRES ||

## TO GO STRAIGHT USE:

Alignment Testers  
 Drive-over  
 Single wheel  
 Double wheel  
 Indicators  
 Gages  
 Templates  
 Level racks  
 Tracking gages  
 Bending tools  
 Blacksmith equipment  
 Presses  
 Axle  
 Arbor  
 Straightening gages  
 Straight edges  
 Squares  
 Angles  
 Spirit level  
 Plumb bob

WHEN one front tire of a truck shows signs of wearing faster than its partner, someone is expected to determine the cause and find a remedy. Tire station and truck shop may pass the buck good-naturedly for awhile, but this only postpones, without preventing the show-down when the owner demands an answer.

Because of no lack of good intentions do service men fail, at times, to give the correct answer forthwith. The problems involved are serious and complex. The individual shop man tackling them single-handed is outnumbered before he starts. But he need not despair. He is not obliged to wrestle with this problem unaided.

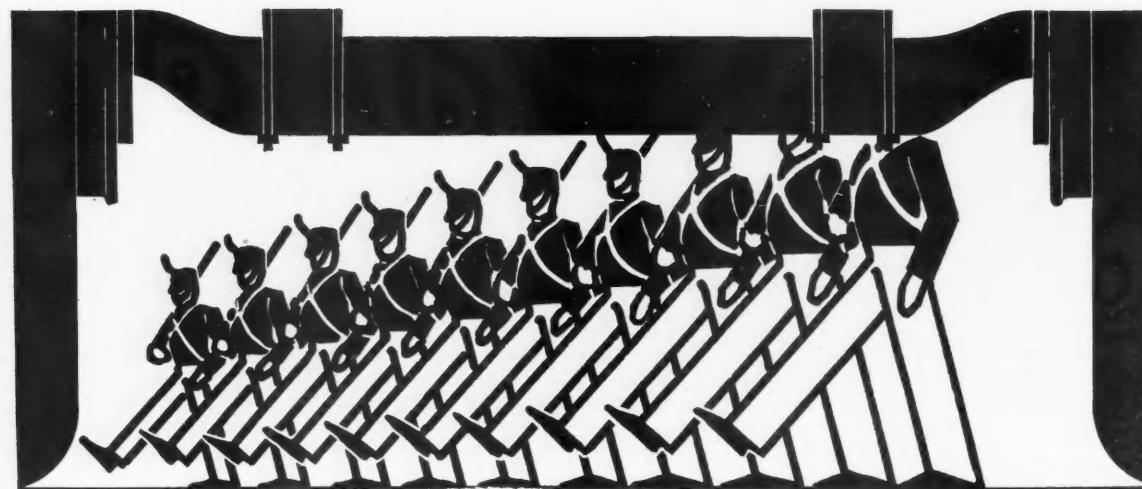
Front end alignment of motor trucks bothered vehicle builders, tire makers and service organizations. Its solution cost them many dollars, much time and more than a little of what is described in damage suits as "mental anguish." Out of the research of factories and the resources of tool builders has come an understanding of, and a solution for, the difficulties of keeping tires running in the paths they should follow. The factors involved have been determined, their relation established and their limits set.

Camber, caster, toe-in and steering geometry are the factors involved in front end alignment. Despite their dissimilar meanings, they have one

common characteristic. All are expressed in small units of measurement and must be determined and checked with the utmost accuracy. A mechanic who can tell by looking at a pair of front wheels whether the toe-in is  $\frac{1}{8}$  or  $\frac{3}{16}$  in. is following the wrong vocation. He should be an astronomer. Difference of caster between wheels caused by a slight twist of an axle cannot be detected by a yard stick, distributed free by a local merchant.

Aligning equipment now on the market makes it possible to measure the four factors involved in wheel alignment quickly and accurately. The more common measurement, that of toe-in, which is the distance between front wheels at their forward point and at the rear point. This distance is measured directly in inches, or on a metric scale; it is determined from the angle between the wheels and it is checked by measuring the scuffing, of inches, if any, of the tires. Many different types of equipment have been designed for measurements of this type. Of those which measure scuffing, there is a portable type which detects the tendency of one wheel on the ground to go to the right or left while the other wheel is moving over a board toe-out as the vehicle is driven over type of machine measures toe-in or toe-out as the vehicle is driven over

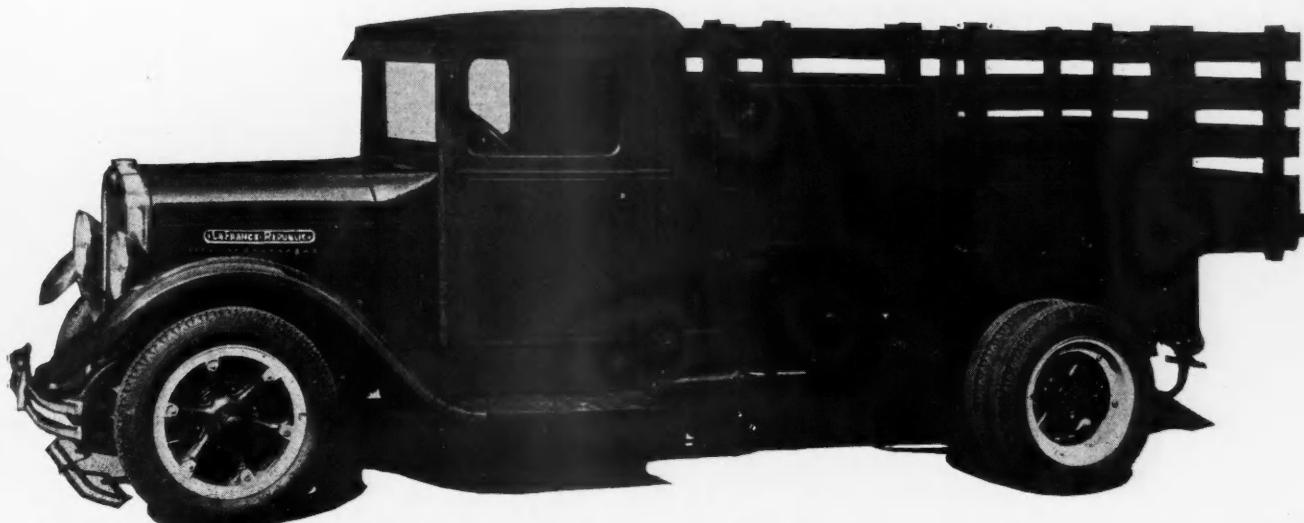
TURN TO PAGE 60, PLEASE



# LAFRANCE-REPUBLIC

Model A-1  
 6-Cylinder—1-1½ Ton Truck  
 \$795.00 Chassis

F.O.B. Factory



Built of truck designed units. Built to take care of your trucking problem at lowest cost to owner. All from the standpoint of initial cost, operating cost, and service cost. The same quality that has been found in American-LaFrance and Republic trucks

since their inception is still found in this popular model. The A-1 is not a recent announcement, but has been in production for the past year—not guess work—TRIED and PROVEN.

#### COMPLETE LINE CONSISTING OF

LaFRANCE-REPUBLIC MODELS  
 A-1—6-Cylinder—Bevel Drive—1 Ton  
 C-1—6-Cylinder—Bevel Drive—1½ Tons  
 D-1—6-Cylinder—Bevel Drive—2 Tons  
 F-2—6-Cylinder—Bevel Drive—3 Tons  
 H-2—6-Cylinder—Bevel Drive—4 Tons  
 M-2—6-Cylinder—Double Reduction Drive—5 Tons

#### AMERICAN-LaFRANCE MODELS

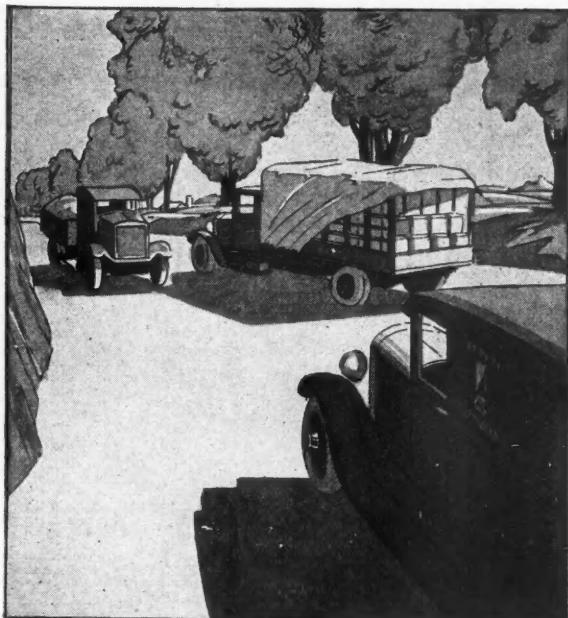
Chief—6-Cylinder—Worm Drive  
 Chieftain—6-Cylinder—Worm Drive



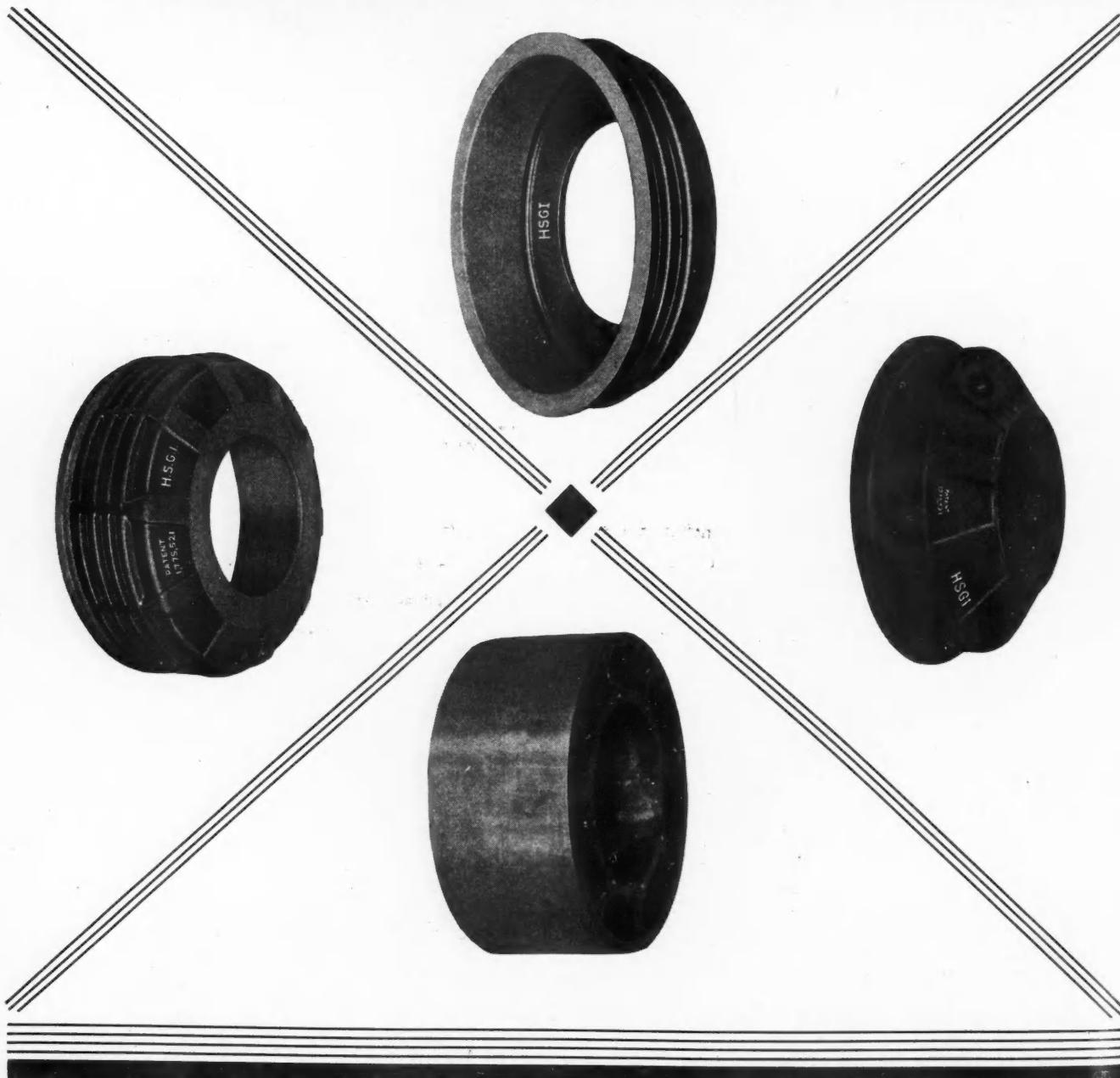
Complete detailed specifications will be sent upon application

LAFRANCE-REPUBLIC CORPORATION  
 ALMA, MICHIGAN

LaFrance-Republic—Designed and Built for Satisfaction and Service



H S G I  
REG. U. S. TRADE MARK



# A MARK OF QUALITY

# AN ASSURANCE OF ECONOMY

## HUNT-SPILLER AIR FURNACE GUN IRON BRAKE DRUMS ASSURE ECONOMY

In modern highspeed transportation brakes come into action frequently and dependable brake drums are required. Profitable transportation demands longer and more continuous hours of Brake Service.

Fewer brake adjustments, maximum brake drum and brake lining mileage, less time in the shop for brake repairs, are economies assured by the use of the smooth, non-scoring, wear-resisting HUNT-SPILLER GUN IRON BRAKE DRUMS.

By actual service records HUNT-SPILLER AIR FURNACE GUN IRON BRAKE DRUMS have proved their superiority.

In selecting a brake drum for your equipment profit by the experience of thousands of operators. Equip one of your trucks with H S G I Drums. Let that unit demonstrate the economies which HUNT-SPILLER GUN IRON can provide for your entire fleet.

There is a HUNT-SPILLER design of drum for every type of commercial vehicle.



# Hunt-Spiller Mfg. Corp

J. G. Platt, Pres. and Gen. Mgr. V. W. Ellet, Vice-Pres.  
Office and Works

383 Dorchester Avenue  
South Boston, Mass.



## MAKING THE AGE OF SPEED THE AGE OF SAFETY

THE Cleco Multi-Power Brake Booster has, for the first time, placed deceleration on a par with present-day acceleration. Revolutionary in design, low in first cost, this all-mechanical booster unit amplifies pedal power 300%. Being an integral part of the braking system, it *cannot* fail. It gives the most dependable braking available today.

Through an increase in brake-lining clearance and the elimination of "brake-riding", the Cleco Multi-Power Booster quickly saves its first cost in brake-lining replacement.

The Cleco Multi-Power Brake Booster is manufactured by The Cleveland Pneumatic Tool Company, Cleveland, Ohio. Export Department, 40 Rector St., New York City. Also manufacturers of Cleco-Gruss Air Springs.

# CLECO AUTOMOTIVE PRODUCTS

MANUFACTURED BY THE CLEVELAND PNEUMATIC TOOL CO., CLEVELAND, OHIO

# A Hydraulic Jack that doesn't leak or settle under load...

*Model DP-1, 8-12 tons capacity, Price \$70.00.*

*Model SP-3, 6 tons capacity, Price \$50.00.*

*These are two most serviceable models for the truck repair shop. Specifications on request.*



## A few well-known users of Vickers Jacks

Autocar  
Diamond T  
Federal  
Greyhound Lines  
Mack  
Sterling  
Stewart  
Standard Oil,  
(N.Y., N.J., and La.)  
Ford Motor Co.  
Packard Motor Car Co.  
and others of like prominence.

*BUILT IN CAPACITIES FROM 3 TO 15 TONS*

## VICKERS HEAVY DUTY HYDRAULIC JACKS

VICKERS MANUFACTURING CO.

690 Territorial Road  
BENTON HARBOR, MICH.

*Model GS-1 3 tons capacity. FAST—SAFE—POSITIVE. Eight full strokes raises plungers to limit. Price.....\$35.00*



Vickers Hydraulic Jacks present new and unique features from both structural and engineering standpoints. Designed for hard and long constant service, many radical changes have been made from other type jacks.

Vickers Jacks lift the load directly on the plungers without the use of a cantilever arm, or extreme high oil pressures.

No leather packings are used.

No mineral or lubricating oil is used inside the jack.

It is not supported on a frame.

Plungers are solid one piece construction.

**ONE VALVE ONLY UNDER DIRECT CYLINDER PRESSURE.** No stuffing boxes, oil ports, vents, oil return pipes to leak,—or become clogged or broken.

Plungers may be pumped down avoiding hanging up of the load.

Safety valve prevents overloading or abuse.

Three point suspension of load in all heavy duty models.

Operates in sub-zero weather same as on a summer day.

Lightest in weight for rated capacities.

A releasing mechanism that is absolutely safe to both load and operator.

Auxiliary release valve prevents load crashing.

Narrow construction permits placing between tandem wheels of six-wheelers for lifting entire rear end.

By use of special extension heads, jack may be used for removal or installation of shackle bolts, body lifting, etc.

Write for complete information about our entire line of jacks for TRUCK SERVICE.

## "Right Dress" Front Ends and Save Tires

CONTINUED FROM PAGE 54

movable plates placed into the floor.

Caster and toe-in may be measured directly or in degrees. If much front end alignment work is done, it is convenient to have a surface which is known to be flat, smooth and level. Such a surface may be used for gages, scales and squares which read distance or angle directly with the surface as a base.

Heavy-duty presses which increase or decrease camber may be applied to an axle without removing it from the vehicle.

If one steering arm is bent and toe-in is restored by lengthening or shortening the steering tie rod, the repair may throw the geometry of the front end out of adjustment. The effect is to give too much or too little toe-in when the wheels are turned right or left. A complete check of steering geometry therefore is of toe-in at various degrees of turning.

## Lathes Turn Slews of Jobs into Profit

CONTINUED FROM PAGE 48

the bushing is cut and then removed and reversed in chuck and cut to size.

In the foregoing operation the tools are stationary, but there are many operations where the reverse is true on some of the operations. For example, the drill may be driven by the head-stock spindle and work fed by the tail stock. When reaming a piston pin, the reamer is driven by the head stock and the piston held by hand. Sometimes the skirts of rough or semi-finished pistons are reamed or counter-bored to receive adaptors for turning, in which case the piston is centered on the tail stock and supported by hand as it is fed against the cutter turned by the head stock.

Both external and internal grinding is usually accomplished by mounting a portable tool-post power grinder on the carriage and the work to be ground in the lathe. In grinding operations both the work and the grinder revolve.

When cutting threads, either right or left hand, outside or inside, the carriage carrying the cutting tool is propelled by the lead screw a predetermined distance per revolution of work. This distance depends on the number of threads per inch to be cut and is varied by changing the gears which drive the lead screw. Standard threads may also be cut by taps and dies, in which case the work is also driven and the tap or die held.

Tapers are cut by mounting work, offsetting the tail stock, or by employing automatic cross and longitudinal feeds.

## Straighten Bent Backs With Floor Equipment

CONTINUED FROM PAGE 29

instances are left on the floor because of their weight and size. Stands, however, are available for this purpose and their use saves many hours of time-consuming and arduous labor. Some engine stands are designed so that they can be converted readily into axle stands, thereby doubling their usefulness.

Smaller units when removed should be carried to wall or portable benches for repair. Removing such assemblies and working on them to the side of the chassis wastes time.

Pits or ramps are another way of overcoming the disadvantages of working on the floor. Modern pits provide ample working room for mechanics in standing posture and easy entrance and exit. They comprise a lower level floor above which the truck is supported on channel iron or concrete runways. Some shops have several pits connected by passageways in which work benches are usually placed. Ramped racks also permit the mechanic to work under chassis without lying down or working in uncomfortable positions.

## Grinders Keep Other Tools on Edge

CONTINUED FROM PAGE 47

welds, sanding down castings, besides general grinding, polishing and buffing operations.

Service stations having machine shop equipment, or even smaller shops having only a lathe, can use tool post grinders profitably in the performance of a number of odd jobs frequently turning up in the course of a day's work in the shop. By mounting a grinder of this type in a lathe, the lathe is converted into an internal grinding machine and can be employed for grinding centers, finishing up small-bore cylinders, as well as doing light internal grinding jobs of all kinds. Supplied with external grinding attachments, the equipment can be used for grinding journals, pins, etc.

Repair shops large enough to include the complete machine tool equipment have separate internal and external grinders. Internal grinders are used for cylinder bores, external grinders for crankshaft bearings and pistons.

## Welding Keeps Metal Hunks Off Junk Pile

CONTINUED FROM PAGE 28

water jackets without general pre-heating and when there is danger of cracking due to expansion and contraction. It is also employed when working with malleable iron, brass, bronze, copper, in fact, almost any metal except aluminum, lead alloys and close-grained steels. Preheating is required on large and intricate castings, and castings having blind cracks, but this also is true in gas fusion welding.

The electric arc welder is usually limited to work on steel and cast steel, in which field it is ideal. However, it is sometimes used on cast iron if high tensile strength is not essential, because the tremendous heat of the arc removes some of the original characteristics of the cast iron, making the metal around the weld very brittle. But despite this physical weakness, use of the arc on cast iron in some cases, especially where the weld is not required to withstand great shock or excessive pressure, has been found very satisfactory and economical. For example, a cracked water jacket can be quickly and easily repaired in the chassis by an arc, whereas the cost of removing the block and preheating it for a gas weld might cost almost as much as a new block. Were it not for the fact that the arc is small and that the heat from it is confined to a small area immediately around the point being welded, cast iron could not be handled at all. It should be remembered, however, that blocks are sometimes bronze welded in the chassis. Establishments fortunate enough to be equipped with both types of welding outfits prefer to use the electric arc on steel jobs wherever possible because it is faster, costs less and work is less liable to warp.

Metals are preheated to bring about uniform expansion at temperatures somewhat below the fusion point to prevent cracking and internal strains. It is done by placing the part in a furnace or by applying a blow torch. Even cooling after the repair is just as important and is brought about by gradual cooling in the furnace or by spreading some insulating material such as lime over the part. Preheating is necessary on cast iron and cast aluminum unless the form of the material will allow expansion freely.

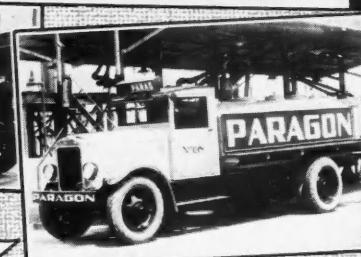
Welding tables which incorporate a bed of refractory material heated by gas, looking like a bed of coals, and a grating are useful for preheating small parts and for maintaining heat during welding of large parts which have been heated in other furnaces.

=PROVED=  
SAVINGS

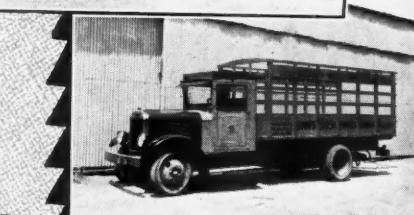
WITH  
RELAY

PROVED  
BY THE  
EXPERIENCE OF  
LARGE BUYERS

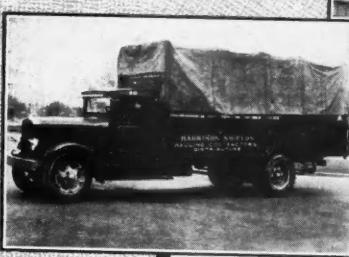
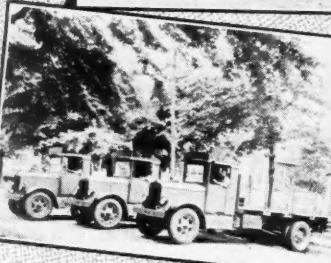
See Proof



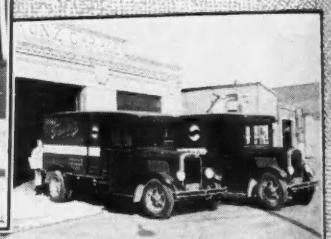
OIL



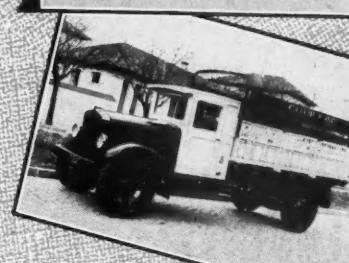
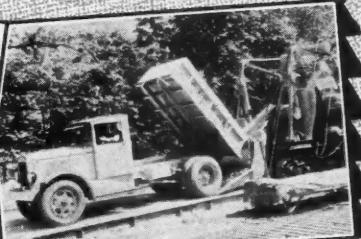
LUMBER



CONTRACT HAULING

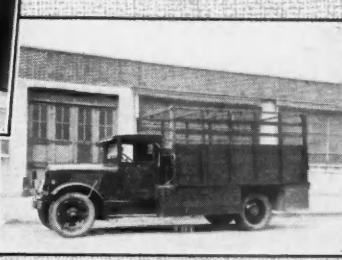
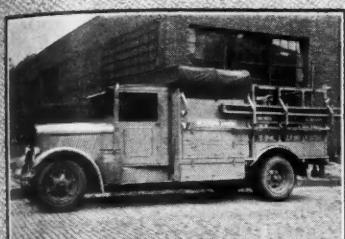


MEAT PACKING



ROAD BUILDING

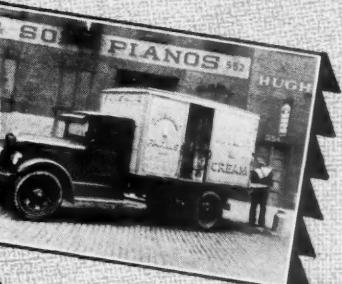
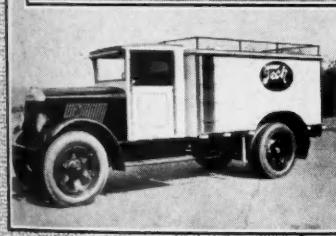
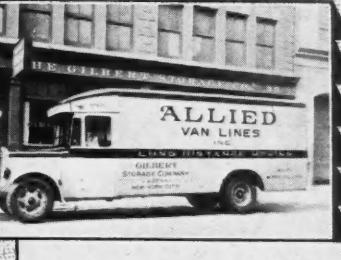
GROCERIES



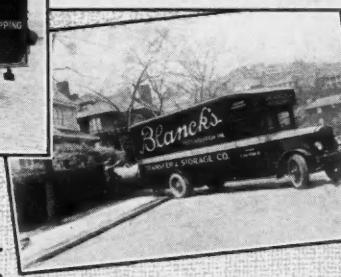
## BUILDING



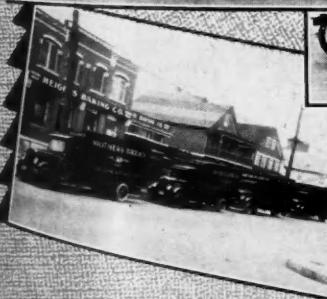
## UTILITIES



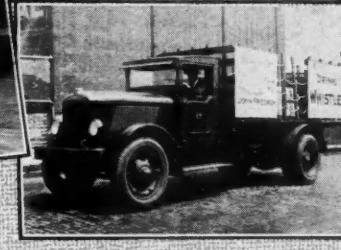
## MOVING



## DAIRIES



## BAKING



## BOTTLING

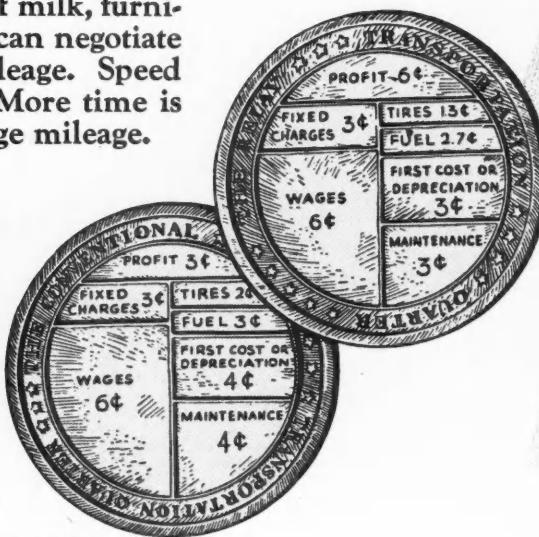
# because Relay Saves... 3¢ per Average Mile

**T**HE Relay Drive does for the truck horizontally what the springs do vertically. The load instead of being rigidly fixed above the center of the rear wheels is free to swing pendulum-like below the wheel center. This horizontal oscillation reduces the shocks of travel approximately one-half; uses the load to help propel and retard the vehicle; and gives greatly added traction. Use of the oscillating drive reduces tire costs one-third, fuel cost a tenth, and depreciation and maintenance one-fourth each, giving an average saving in the total cost of transportation of 3c per mile.

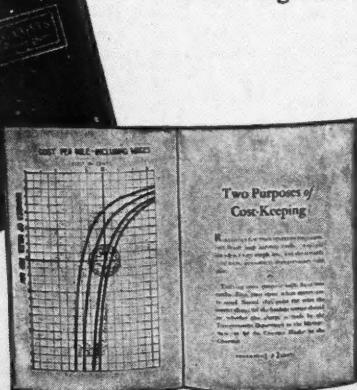
The results of a questionnaire to 300 Relay owners show actual tire mileage 68% greater than with conventional trucks. By interposing a horizontal defense against road shock, the impacts suffered over normal roads at normal speeds are shown to be reduced approximately one-half. If a conventional truck has a life of four years, the Relay truck will have a life one-third greater, or  $5\frac{1}{3}$  years. The lowered impacts result in reduced crystallization in all moving parts. This reduction gives an average saving in repairs amounting to more than a third. These lessened road blows naturally benefit the cargo as well as the truck. Less breakage of perishable goods, better condition of milk, furniture, flowers, etc., are the results. A truck that can negotiate difficult road conditions gives added daily mileage. Speed need not be lessened because of rough going. More time is spent on the road thus further increasing average mileage.

The savings with Relays have been proved by the experience of hundreds of owners, —3c per average mile.

**RELAY MOTORS  
CORPORATION**  
LIMA  
OHIO



RELAY MOTORS CORPORATION will gladly send you your copy of this monograph on "Trucking Costs." Please sign this card and return.



A Valuable 48 Page Book Just Published

Name of Company

Address

Signature

Title

**GET THIS  
VALUABLE BOOK  
by mailing  
Coupon  
TODAY**

PRINTED IN U.S.A.  
MANZ CORPORATION - CHICAGO-NEW YORK

# COMMERCIAL CAR JOURNAL

Gentlemen,  
Here's to You!...



Thomas H. Cook, Advertising Manager,  
Fageol Motors Co., Oakland, Calif.

## TABLE OF TRUCK SPECIFICATIONS

Corrected Each Month From Data  
Supplied Direct by Manufacturers

(KEY TO REFERENCES ON PAGE 80)

**F**EDERAL enters the tractor-truck classification in tables this month with seven models, six of which are listed elsewhere as trucks and adds a 2½-3 ton six-wheeler, designated as Model E6SW.

Other models joining the ranks of those in tables of specifications include:

Brockway; 175 3-ton.

Diamond T; 504 3-ton.

Indiana; 175 3-ton, 220 3½-ton.

International; AW2 as tractor-truck.

J. Wiggers, Chief Engineer, Moreland  
Motor Truck Co., Los Angeles, Calif.



L. J. Farrell, Engineering Staff, Pierce-Arrow Motor Car Co., Buffalo, N. Y.



W. F. McDonald, Sales Manager,  
MacCar Corporation, Scranton, Pa.

The unquestioned trust which the truck industry places in this Table of Truck Specifications is due to the splendid collaboration of men at the factories who each month correct the statistical data and keep it up-to-date. For their valued cooperation in making the data authentic the Commercial Car Journal makes this acknowledgment of gratefulness and knows that those who make use of the Table will join in saying, "Gentlemen, here's to you!" (Next month the tribute will be extended to another group of collaborators.)

Line Number	Make, Model and Capacity	General			Tire Size		Chassis Wt. (Stripped)	Make and Model	Number of Cylinders Bore and Stroke	Engine			Fuel System	Electrical System	Line Number										
		Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Front				Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement	Camshaft Drive	Dia. Main Bearings	Length Main Bearings	No. Main Bearings	Oiling System	Carburetor Make	Fuel Feed	Ignition System	Governor Make	Generator, Starter Make		
<b>1000 Pounds</b>																									
1	Chevrolet Int. Com.	400	107	107	1815	B 4.50/20	B 4.50/20	Own	6-3 1/2 x 3 1/2	193.9	26.3	48-2800	L G A	2 1/2	6 1/2	3	PG	No	Car	P	D-R	D-R	1		
2	Dodge Bros. . . . .	435	109	109	1855	B 5.00/19	B 5.00/19	Own	4-3 1/2 x 4 1/2	196	21.0	61-3400	L G A	2 1/2	3 1/2	4	FP	No	Car	M	D-R	D-R	2		
3	Dodge Bros. . . . .	515	109	109	4025	1960	B 5.25/19	Own	6-3 1/2 x 4 1/2	189	8.23.4	189	L G A	1 1/2	7	3	PG	No	Car	M	N-E	N-E	3		
4	Fargo Packet	595	103	103	1935	B 5.00/19	B 5.00/19	Own	6-3 1/2 x 4 1/2	189	8.23.4	189	L G A	2 1/2	5 1/2	3	PC	No	Str	G	Own	Own	4		
5	Ford . . . . .	845	103	103	3800	1980	B 5.00/19	B 5.50/19	Own A	4-3 1/2 x 4 1/2	200	5.24.0	40-2200	L G A	1 1/2	7	3	PG	No	Zen	G	Own	Own	5	
6	Gen. Mot. T11-1001 (x)	625	109	109	3800	1980	B 5.00/19	B 5.50/19	Pontiac	6-3 1/2 x 3 1/2	200	3.26.3	58-3000	L G A	2 1/2	6 1/2	4	PC	No	Mar	M	D-R	D-R	6	
7	Reo . . . . .	785	115	115	4000	2150	B 5.00/19	B 5.00/19	Con 22-A	6-3 1/2 x 4 1/2	214	7.27.3	60-2800	L G A	2 1/2	6 1/2	4	PC	No	Sch	P	D-R	D-R	7	
8	Rugby . . . . .	614	103	103	3500	1665	B 4.75/19	B 4.75/19	Own 96A	6-3 1/2 x 4 1/2	199	0.25.3	58-3100	L G C	2 1/2	5 1/2	3	CC	No	Str	M	A-L	A-L	8	
9	Whippet . . . . .	360	103	103	3500	1665	B 4.75/19	B 4.75/19	Own 96A	4-3 1/2 x 4 1/2	145	7.15.6	40-3200	L G C	2 1/2	5 1/2	3	CC	No	Til	V	A-L	A-L	9	
10	Willys Six . . . . .	525	110	110	3700	1904	B 5.00/19	B 5.00/19	Own 98A	6-3 1/2 x 4 1/2	193	0.25.3	65-3400	L G C	2 1/2	6 1/2	4	CC	No	Til	V	A-L	A-L	10	
<b>1500 Pounds</b>																									
11	Dodge Brother . . . . .	695	124	124	4760	2260	B 5.50/20	B 5.50/20	Own	4-3 1/2 x 4 1/2	175	4.21.0	45-2800	L G S	2 1/2	6 1/2	3	PC	No	Car	V	D-R	D-R	11	
12	Dodge Brothers . . . . .	745	124	124	4760	2380	P 30x5	P 30x5	Own	4-3 1/2 x 4 1/2	175	4.21.0	45-2800	L G S	2 1/2	6 1/2	3	PC	No	Car	V	N-E	N-E	12	
13	Dodge Brothers . . . . .	795	124	124	4860	2360	B 5.50/20	B 5.50/20	Own	6-3 1/2 x 3 1/2	208	0.27.3	63-3200	L G C	2 1/2	6 1/2	3	PC	No	Str	G	Own	Own	13	
14	Dodge Brothers . . . . .	845	124	124	4860	2480	P 30x5	P 30x5	Own	6-3 1/2 x 3 1/2	208	0.27.3	63-3200	L G C	2 1/2	6 1/2	3	PC	No	Str	V	N-E	N-E	14	
15	Fargo Clipper . . . . .	725	124	124	2340	B 5.50/18	B 5.50/18	Own	6-3 1/2 x 3 1/2	195	6.24.0	58-3000	L G C	2 1/2	5 1/2	3	PC	No	Str	V	D-R	D-R	15		
16	Fisher Standard Jr. B. . . . .	120	124	6000	2650	B 5.50/20	B 5.50/20	Own W10	4-3 1/2 x 4 1/2	200	5.24.0	45-2800	L G C	2 1/2	5 1/2	3	FP	No	Car	V	A-L	A-L	16		
17	Fisher Standard Jr. B. . . . .	125	124	6000	2650	P 30x5	P 30x5	Own	6-3 1/2 x 4 1/2	214	7.27.3	60-2800	L G C	2 1/2	5 1/2	3	FP	No	Zen	V	A-L	A-L	17		
18	Gen. Mot. T15-1501 (x)	695	130	141	5400	2625	B 5.50/20	B 5.50/20	Pontiac	6-3 1/2 x 3 1/2	200	3.26.3	58-3000	L G C	2 1/2	6 1/2	3	PC	No	Mar	M	D-R	D-R	18	
19	International . . . . .	124	124	2200	2200	B 5.25/20	B 5.25/20	Wau XA	4-3 1/2 x 4 1/2	173	0.19.6	30-2700	L G C	2 1/2	6 1/2	3	PC	No	Zen	V	D-R	D-R	19		
20	International . . . . .	136	136	2620	2620	B 5.25/20	B 5.25/20	Wau XA	4-3 1/2 x 4 1/2	173	0.19.6	30-2700	L G C	2 1/2	6 1/2	3	PC	No	Zen	V	D-R	D-R	20		
21	Paige . . . . .	860	115	115	4930	2465	B 5.50/19	B 5.50/19	Own	6-3 1/2 x 4 1/2	224	2.25.3	76-3400	L G C	2 1/2	5 1/2	3	PC	No	Str	M	A-L	A-L	21	
22	Relay . . . . .	1370	131	131	3750	P 30x5	P 30x5	Own	6-3 1/2 x 4 1/2	214	7.27.3	52-2200	L G C	2 1/2	5 1/2	3	PC	No	Str	M	D-R	D-R	22		
23	Studebaker . . . . .	845	115	115	2325	P 6.00/19	P 6.00/19	Own	6-3 1/2 x 4 1/2	221	4.27.3	71-3200	L G C	2 1/2	5 1/2	3	PC	No	Str	M	D-R	D-R	23		
<b>1 Ton</b>																									
24	Acme . . . . .	17	1060	136	6400	3100	P 30x5	P 30x5	Con 29L	6-2 1/2 x 4 1/2	185	0.19.8	44-2800	L G A	2 1/2	5 1/2	4	FP	No	Til	V	A-L	A-L	24	
25	Atterbury . . . . .	1095	132	145	6915	3530	P 30x5	P 30x5	Lye WRC	6-2 1/2 x 4 1/2	185	0.18.2	60-3000	L G S	2 1/2	5 1/2	4	PC	No	Zen	G	A-L	A-L	25	
26	Available . . . . .	T-10	Op	9000	3530	P 30x5	P 30x5	Con 18E	6-3 1/2 x 4 1/2	215	2.27.3	61-2900	L G C	2 1/2	5 1/2	4	CC	No	Sch	M	D-R	D-R	26		
27	Brockway . . . . .	50	141	6000	3200	P 30x5	P 30x5	Con	6-3 1/2 x 4 1/2	208	0.27.3	63-3200	L G C	2 1/2	5 1/2	4	CC	No	Zen	V	A-L	A-L	27		
28	Brockway . . . . .	65	137	149	6500	3400	P 30x5	P 30x5	Con	6-3 1/2 x 4 1/2	248	2.27.3	65-2700	L G C	2 1/2	5 1/2	4	CC	No	Zen	V	A-L	A-L	28	
29	Commerce . . . . .	S-11	1600	142	6000	3900	P 30x5	P 30x5	Bud HS6	6-3 1/2 x 4 1/2	241	6.27.3	52-2200	L G C	2 1/2	5 1/2	4	CC	No	Zen	V	A-L	A-L	29	
30	Day Elder . . . . .	60	195	135	156	6000	3200	P 30x5	P 30x5	Bud 25A	6-3 1/2 x 4 1/2	190	0.22.5	67-3000	L G C	2 1/2	5 1/2	4	CC	No	Zen	V	A-L	A-L	30
31	Diamond T . . . . .	200	785	128	128	6500	3050	P 30x5	P 30x5	Bud 1199	6-3 1/2 x 4 1/2	198	0.22.5	57-3000	L G C	2 1/2	5 1/2	4	CC	No	Zen	V	A-L	A-L	31
32	Diamond T . . . . .	215	885	135	158	6500	3150	P 30x5	P 30x5	Bud 214	6-3 1/2 x 4 1/2	198	0.22.5	61-3000	L G C	2 1/2	5 1/2	4	CC	No	Zen	V	A-L	A-L	32
33	Fargo Freight . . . . .	795	144	162	7500	3400	P 30x5	P 30x5	Own	6-3 1/2 x 4 1/2	214	7.27.3	60-2800	L G C	2 1/2	5 1/2	4	FP	No	Zen	V	N-E	N-E	33	
34	Fisher Standard . . . . .	10A	144	162	7500	3400	P 30x5	P 30x5	Con 17E	6-3 1/2 x 4 1/2	214	7.27.3	61-3000	L G C	2 1/2	5 1/2	4	FP	No	Zen	V	A-L	A-L	34	
35	Garford . . . . .	S-11	1600	142	6000	3900	P 30x5	P 30x5	Bud HS6	6-3 1/2 x 4 1/2	241	6.27.3	52-2200	L G C	2 1/2	5 1/2	4	PC	No	Zen	V	A-L	A-L	35	
36	Gen. Mot. T17-1703 (x)	745	130	141	6000	2670	B 7.00/20	B 7.00/20	Pontiac	6-3 1/2 x 4 1/2	200	3.26.3	58-3000	L G C	2 1/2	5 1/2	4	PC	No	Zen	V	A-L	A-L	36	
37	Gramm-Bernstein . . . . .	10	129	146	7000	3100	P 30x5	P 30x5	Con 29L	6-3 1/2 x 4 1/2	185	0.19.8	45-2300	L G C	2 1/2	5 1/2	4	FP	No	Zen	V	A-L	A-L	37	
38	Hahn . . . . .	7H	124	149	7500	3100	P 30x5	P 30x5	Con 29L	6-3 1/2 x 4 1/2	185	0.19.8	45-2300	L G C	2 1/2	5 1/2	4	FP	No	Zen	V	A-L	A-L	38	
39	Indiana . . . . .	60	124	149	6500	3100	P 30x5	P 30x5	Con 29L	6-3 1/2 x 4 1/2	185	0.19.8	45-2300	L G C	2 1/2	5 1/2	4	FP	No	Zen	V	A-L	A-L	39	
40	Indiana . . . . .	64	137	149	6500	3100	P 30x5	P 30x5	Con 29L	6-3 1/2 x 4 1/2	185	0.19.8	45-2300	L G C	2 1/2	5 1/2	4	FP	No	Zen	V	A-L	A-L	40	
41	Int. 6 Sp. Spec. . . . .																								

Line Number	Radiator Make		Gear Set	Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and No.	Make and Model	Rear Axle		Front Axle	Brakes	Frame	Body Mounting Data		Springs		Line Number				
	Clutch	Type and Make							Final Drive and Type	Drive and Torque				Make and Model	Service	Area Service	Brakes	Hand				
																Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle			
									Reduc. in High	Reduc. in Low						Front	Rear					
1	Har	P.Own	Own Int.	U 3	No	Own 2	Own Int.	S 1/2	H 3.82	12.7	Own Int.	L4IH	114 TX	Own War	5x1 1/2 x 4 1/2	C	53 1/2	26%	42 1/2	35 1/2 x 1 1/2	53 1/2 x 1 1/2	1
2	Fed	P.B&B	Own	U 3	No	U-P 2	Own	S 1/2	H 4.66	.....	.....	L4IH	114 TX	War	5x1 1/2 x 4 1/2	C	53 1/2	26%	42 1/2	35 1/2 x 1 1/2	53 1/2 x 1 1/2	2
3	Fed	P.B&B	Own	U 3	No	U-P 2	Own	S 1/2	H 4.66	.....	.....	L4IH	114 TX	War	5x1 1/2 x 4 1/2	C	53 1/2	26%	42 1/2	35 1/2 x 1 1/2	53 1/2 x 1 1/2	3
4	Own	D.Own	Own	U 3	No	Own	Own	S 1/2	H 4.7	14.3	Own	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	
5	Own	D.Own	Own	U 3	No	Own	Own	S 1/2	H 4.42	14.7	Pontiac	O4IM	200 4I	2I	Own	.....	.....	.....	.....	.....	.....	5
6	Lon	P.Own	Pontiac	U 3	No	M.M.	Pontiac	S 1/2	H 4.7	14.7	Pontiac	S4IM	141 TX	Jac	6x2 1/2 x 4 1/2	C	52 1/2	26%	44	36x2	54x2	6
7	Har	P.B&B	W-G	U 3	No	Spi 2	Adams	S 1/2	H 4.7	15.6	Adams	S4IM	178 4I	Ros	5 1/2 x 2 1/2 x 4 1/2	C	52 1/2	26%	37x2	55x2	7	
8	McC	P.B&B	War	U 3	No	M.M.2	Own	S 1/2	H 4.55	14.1	Own	B4IM	138 4I	Own	4 1/2 x 1 1/2 x 4 1/2	C	52 1/2	26%	36x1 1/2	55x2	8	
9	Fed	P.B&B	Own	U 3	No	M.M.2	Own	S 1/2	H 4.6	13.4	Own	B4IM	147 4I	Own	5 1/2 x 1 1/2 x 4 1/2	C	52 1/2	26%	36x1 1/2	55x2	9	
10	Fed	P.B&B	Own	U 3	No	U-P 2	Own	S 1/2	H 4.7	15.1	Own	.....	.....	.....	.....	.....	.....	.....	.....	10		
11	Fed	P.B&B	W-G	U 3	No	Spi	Own	S 1/2	H 5.63	212	Own	L4IH	189 TX	Han	6x2 1/2 x 4 1/2	C	66 1/2	31	37 1/2	39x2	48x2 1/2	11
12	Fed	P.B&B	W-G	U 3	No	Spi	Own	S 1/2	H 5.63	21.2	Own	L4IH	189 TX	Han	6x2 1/2 x 4 1/2	C	66 1/2	31	37 1/2	39x2	48x2 1/2	12
13	Fed	P.B&B	W-G	U 3	No	Spi	Own	S 1/2	H 5.11	19.2	Own	L4IH	189 TX	Han	6x2 1/2 x 4 1/2	C	66 1/2	31	37 1/2	39x2	48x2 1/2	13
14	Fed	P.B&B	W-G	U 3	No	Spi	Own	S 1/2	H 5.11	19.2	Own	L4IH	189 TX	Han	6x2 1/2 x 4 1/2	C	66 1/2	31	37 1/2	39x2	48x2 1/2	14
15	Own	D.Own	Own	U 3	No	Own	Own	S 1/2	H 4.9	15.5	Own	.....	.....	.....	.....	.....	.....	.....	.....	15		
16	Lon	P.Lon	W-G T-9	U 4	No	Blo 2	Sal F	S 1/2	H 5.37	34.4	Sal F	L4IH	362 TX	Ros	6 1/2 x 2 1/2 x 4 1/2	C	84	47 1/2	32	40x2	54x2 1/2	16
17	Lon	P.B-L	B-L 214	U 4	No	Blo 2	Sal F	S 1/2	H 5.37	34.4	Sal F	L4IH	362 TX	Ros	6 1/2 x 2 1/2 x 4 1/2	C	84	47 1/2	32	40x2	54x2 1/2	17
18	Lon	P.Own	Own	U 3	No	M.M.	Tim 51500	S 1/2	H 4.86	16.1	Tim 11709	B4IM	308 4I	Jac	6x2 1/2 x 4 1/2	C	87	48	34	38x2	50 1/2 x 2 1/2	18
19	Lon	Roc	M.M.	U 3	No	M.M.4	Eat 502	S 1/2	H 4.45	15.1	Eat 200F	BE4IM	256 2I	Ros	4 1/2 x 1 1/2 x 4 1/2	C	86 1/2	50 1/2	32	40x2	53x2	19
20	Mod	P.Own	MMO	U 3	No	M.M.4	Own 600	S 1/2	H 4.45	17.4	Own 100	B4IM	212 2I	Ros	4 1/2 x 1 1/2 x 4 1/2	C	93 1/2	53 1/2	32	40x2	52x2	20
21	Lon	P.Lon	W-G T-71	A	No	Spi 2	Sal M	S 1/2	H 4.9	17.4	Sal M	4IH	187 T	Ros	5 1/2 x 1 1/2 x 4 1/2	C	96	55	34	36x2	54x2	21
22	Lon	P.B&B	W-G T-9	U 4	No	Blo	Own	2R	H 6.00	38.4	Col 5540	B4IM	227	.....	.....	.....	.....	.....	.....	.....	22	
23	Lon	P.Lon	W-G	U 3	No	Spi	Own	S 1/2	H 4.7	15.1	Own	.....	.....	.....	.....	.....	.....	.....	.....	23		
24	Per	P.B&B	Ful	U 4	No	Blo 3	Tim 52200H	BF	H 5.83	35.9	Tim 11703H	L4IH	380 TX	Ros	4 1/2 x 3 1/2 x 4 1/2	C	108	58	33	37x2	50x2 1/2	24
25	Fed	D.B-L	B-L	U 4	No	Blo	Tim 52200H	BF	H 5.83	43.5	Tim 11703H	L4IH	380 TX	Ros	4 1/2 x 3 1/2 x 4 1/2	C	98 1/2	55	34	38x2	50x2 1/2	25
26	You	D.B-L	B-L 214	U 4	No	Blo	Tim 52200H	BF	H 5.83	37.4	Tim 5429	L4IH	380 TX	Ros	6x2 1/2 x 4 1/2	C	90	52 1/2	34	37x2	52x2 1/2	26
27	G&O	P.B&B	B-L	U 2	No	Spi 2	Col	S 1/2	H 5.12	21.3	Col	B4IM	190 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	95	54	34	37x2	52x2 1/2	27
28	G&O	P.B&B	B-L	U 2	No	Spi 2	Col	S 1/2	H 5.1	25.5	Col	C4IM	190 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	103 1/2	63	34	37x2	52x2 1/2	28
29	Lon	P.B-L	B-L 20	U 4	No	Spi	Tim	B 1/2	H 5.6	36.3	Tim 5530	B4IM	241 2I	Ros	5 1/2 x 3 1/2 x 4 1/2	C	106 1/2	68 1/2	34	40x2	54x2 1/2	29
30	G&O	P.B&B	W-G T-9	U 4	No	Spi 2	Cla B370	S 1/2	H 5.6	36.3	Tim 11703H	B4IM	244 TX	Ros	6x2 1/2 x 4 1/2	C	90	53	34	42x2	50x2 1/2	30
31	G&O	P.B&B	W-G	U 3	No	Spi 2	Cla B370	S 1/2	H 5.6	36.3	Tim 11703H	B4IM	244 TX	Ros	6x2 1/2 x 4 1/2	C	93	53	34	42x2	50x2 1/2	31
32	G&O	P.B&B	W-G	U 3	No	Spi 2	Cla B370	S 1/2	H 5.6	36.3	Tim 11703H	B4IM	244 TX	Ros	6x2 1/2 x 4 1/2	C	93	53	34	42x2	50x2 1/2	32
33	Own	P.Own	Own	U 4	No	U-P 2	Cla	S 1/2	H 5.67	37.2	Own	.....	.....	.....	.....	.....	.....	.....	.....	33		
34	Lon	P.B-L	B-L 214	U 4	No	Blo 3	Tim 52200H	BF	H 5.83	37.4	Tim 11703H	L4IH	380 TX	Ros	6x2 1/2 x 4 1/2	C	106	68 1/2	32	40x2	54x2 1/2	34
35	Lon	P.B-L	B-L 20	U 4	No	Blo	Tim 54028	BF	H 5.1	25.5	Col 5530	L4IH	380 TX	Ros	6x2 1/2 x 4 1/2	C	103 1/2	63	34	38x2	50x2 1/2	35
36	Lon	P.Own	Own	U 3	No	M.M.	Tim 51505	BF	H 1.83	16.0	Tim 11709	B4IM	308 4I	Jac	6x2 1/2 x 4 1/2	C	87	48	34	38x2	50x2 1/2	36
37	Own	D.Ful	D.Ful	U 3	No	Blo	Tim 52200H	BF	H 4.86	20.8	Tim 11703H	L4IH	320 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	97	57 1/2	30 1/2	38x2	50x2 1/2	37
38	G&O	P.B&B	Wat	U 3	No	Spi 2	Col	S 1/2	H 5.59	37.2	Col	B4IM	190 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	96	52 1/2	34	37x2	52x2 1/2	38
39	G&O	P.B&B	Wat	U 3	No	Spi 2	Col	S 1/2	H 5.59	37.2	Col	C4IM	190 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	96	52 1/2	34	37x2	52x2 1/2	39
40	Lon	P.B&B	B-L	U 3	No	Spi 2	Col	S 1/2	H 5.12	21.3	Col	B4IM	190 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	96	52 1/2	34	37x2	52x2 1/2	40
41	Lon	Roc	M.M.	U 3	No	Spi 2	Col	S 1/2	H 5.12	21.3	Col	B4IM	190 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	96	52 1/2	34	37x2	52x2 1/2	41
42	Fed	P.B-L	B-L 214	U 4	No	Spi 2	Tim 51000H	BF	H 4.86	59	Tim 11709	L4IH	380 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	101	68	34	38x2	50x2 1/2	42
43	Fed	P.B&B	W-G	U 4	No	Spi 2	Tim 51000H	BF	H 5.86	36.1	Tim 11709	L4IH	380 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	101	68	34	38x2	50x2 1/2	43
44	G&O	P.B&B	W-G	U 4	No	Spi 2	Tim 51000H	BF	H 5.86	36.1	Tim 11709	L4IH	380 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	101	68	34	38x2	50x2 1/2	44
45	G&O	P.B&B	W-G	U 4	No	Spi 2	Tim 51000H	BF	H 5.86	36.1	Tim 11709	L4IH	380 TX	Ros	5 1/2 x 2 1/2 x 4 1/2	C	101	68	34	38x2	50x2 1/2	45
46	Own	D.B-L	B-L 214	U 4	No	Spi 4	Tim 52200H	BF	H 5.82	36.1	Tim 11703H	L4IH	336 TX	Ros	6x2 1/2 x 4 1/2	C	98	56	34	38x2	52x2 1/2	46
47	Own	P.B-L	B-L 20	U 4	No																	

Line Number	Make, Model and Capacity	General				Tire Size		Front	Rear	Make and Model	Engine				Fuel System	Electrical System									
		Chassis Price	Standard W.B.	Man. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)					Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Value Arrangement	Length Main Bearings	No. Main Bearings	Oiling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Line Number	
<b>1½ Ton—Cont'd</b>																									
1	Gen.Mot. T-25-2508 (x) 1280	130	152	7900	3385	B 6.00/20	DB6.00/20	Bulck		6-3 1/2 x 4 1/2	257.5	28.3	76-2500	H	2 1/2	4	PC	Ha	Mar	M	D-R	D-R	3		
2	Gramm B.	140	174	8400	3800	P 30x5	DP30x5	Lyc		6-3 1/2 x 4 1/2	224.0	25.3	61-2900	L	2 1/2	4	PC	No	Zen	M	A-L	A-L	4		
3	Gramm-Bernstein...10	129	146	7500	6000	B 6.00/20	DB6.00/20	Lyc CT		4-3 1/2 x 5	220.9	22.5	43-2350	L	2 1/2	4	PP	No	Zen	G	A-L	A-L	5		
4	Gramm-Berstein. J	146	182	8200	3980	B 6.50/20	DB6.50/20	Bud J-214		6-3 1/2 x 4	224.0	27.3	62-3000	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	6		
5	Hahn. 17 H	142	122	7900	3750	P 32x6	P 32x6	Con 18E		6-3 1/2 x 4	214.7	27.3	66-3000	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	7		
6	Hahn. 317H	142	122	7900	3900	P 32x6	P 32x6	Con 16C		6-3 1/2 x 4	224.0	27.3	65-2760	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	8		
7	Indiana. 111	129	165	9000	3600	P 32x6	P 32x6	Her		4-4x5	251.5	23.5	46-2000	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	9		
8	Indiana. 89	149	168	9000	3650	P 32x6	P 32x6	Con		6-3 1/2 x 4	224.0	27.3	30-2700	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	10		
9	International. A-2	136	136	2989	B 5.50/20	B 6.00/20		Wau XA		4-3 1/2 x 5	221.0	22.5	43-2350	L	2 1/2	4	PP	No	Zen	V	V	V	11		
10	International. SI-34	160	160	3595	B 5.50/20	B 6.00/20		Lyc CT		6-3 1/2 x 4	224.0	27.3	43-2350	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	12		
11	International. SI-36	160	160	3645	P 30x5	P 30x5	P 30x5	Lyc 45L		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	13		
12	International. SI-36	160	160	3645	P 30x5	P 30x5	P 30x5	Lyc 45L		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	14		
13	International. AL-3	138	164	4300	B 5.50/20	DB6.00/20		Bud H260		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	15		
14	Kenworth. AL-3	100	1995	164	182	10000	4200	P 30x5	DP30x5	Con		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	16
15	Kleiber. 52	1500	152	158	7500	3000	P 32x6	P 32x6	Lyc CT		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	17	
16	LaFrance-Republice-C-1	144	165	7500	3000	B 6.00/20	P 32x6	Con 16C		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	N-E	N-E	18		
17	Lange. R	2225	140	172	9300	4600	P 32x6	P 32x6	Lyc 45L		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	19	
18	Larabee. 25	1945	152	160	9375	4200	B 7.00/20	B 7.00/20	Lyc 45L		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	20	
19	LeMoon. HB17	2000	163	190	10000	3900	P 32x6	DP32x6	Con 16C		6-3 1/2 x 4	224.0	25.3	61-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	21	
20	MacCarr. 36200	154	182	10100	4800	P 32x6	DP32x6	Bud HS		6-3 1/2 x 4	209.6	25.3	55-2200	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	22		
21	MacCarr. BG	3000	138	192	10000	4800	P 32x6	DP32x6	Bud DS 6		6-3 1/2 x 4	241.6	27.3	57-2100	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	23	
22	Relay. 40	2990	168	10000	5300	P 34x5	DP34x5	Bud DS 6		6-3 1/2 x 4	309.6	31.5	56-2000	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	24		
23	Reo. FA-137	1295	137	10000	5325	B 6.50/20	P 32x6	Own		6-3 1/2 x 4	268.3	27.3	67-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	25		
24	Reo. FE	1395	152	10000	3700	B 6.50/20	P 32x6	Own		6-3 1/2 x 4	268.3	27.3	67-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	26		
25	Reo. FF	1395	156	10000	3750	B 6.50/20	P 32x6	Own		6-3 1/2 x 4	268.3	27.3	67-2800	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	27		
26	Rugby. 6-15	930	135	145	7150	3000	B 5.50/20	DP30x5	Con 22A		6-3 1/2 x 4	193.0	23.5	58-3100	L	2 1/2	4	PP	No	Zen	M	A-L	A-L	28	
27	Schacht. De Luxe	155	160	174	8800	4000	B 5.50/20	DP30x5	Con 22A		6-3 1/2 x 4	224.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	D-R	D-R	D-R	29	
28	Selden. 140	160	174	7500	3750	P 32x6	P 32x6	Con 15C		6-3 1/2 x 4	224.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	D-R	D-R	D-R	30		
29	Selden. 142	160	174	7500	3750	P 32x6	P 32x6	Con 16C		6-3 1/2 x 4	224.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	D-R	D-R	D-R	31		
30	Selden. 317	142	122	7500	3750	P 32x6	P 32x6	Con 16C		6-3 1/2 x 4	224.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	32		
31	Service. 40	2990	168	10000	4700	P 34x5	DP34x5	Bud DS 6		6-3 1/2 x 4	309.6	31.5	56-2000	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	33		
32	Service. S11	1900	162	10000	4300	P 30x5	DP30x5	Bud HS6		6-3 1/2 x 4	241.6	27.3	52-2200	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	34		
33	Sterling. DB7-64	137	150	7000	3355	P 32x6	P 32x6	Con 18E		6-3 1/2 x 4	214.7	27.3	57-2500	L	2 1/2	4	PP	No	Zen	D-R	D-R	D-R	35		
34	Stewart. 40X	895	130	160	3215	B 6.50/20	DB6.50/20	Lyc AFE		6-3 1/2 x 4	199.0	22.5	50-2600	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	36		
35	Stewart. 40X	995	130	160	3250	B 6.50/20	DB6.50/20	Lyc 45L		6-3 1/2 x 4	201.5	21.6	60-2800	L	2 1/2	4	PP	No	Zen	D-R	D-R	D-R	37		
36	Studebaker. S-20	695	130	160	2985	B 6.00/20	P 32x6	Own		6-3 1/2 x 4	205.0	25.4	68-3200	L	2 1/2	4	PP	No	Zen	M	D-R	D-R	38		
37	Studebaker. S-20	695	130	160	2985	B 6.00/20	P 32x6	Own GKA		6-3 1/2 x 4	226.4	22.5	31-1600	L	2 1/2	4	PP	No	Zen	V	L-N	L-N	39		
38	White. 20A	2125	145	168	4572	P 34x5	DP34x5	Own 4A		6-3 1/2 x 4	290.0	33.7	64-2200	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	40		
39	White. 61	2140	145	168	4789	P 30x5	DP30x5	Wau 6XK		6-2 1/2 x 4	177.0	20.7	55-3000	L	2 1/2	4	PP	No	Zen	Til	V	A-L	41		
40	Wichita-Knight. T-103	1285	131	131	7000	2848	B 5.50/20	P 30x5	Own 87		6-3 1/2 x 4	193.0	25.3	65-3400	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	42	
41	Willys-Knight. T-103	1285	131	131	7000	2740	B 5.50/20	P 30x5	Own 98B		6-3 1/2 x 4	193.0	25.3	65-3400	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	43	
42	Willys-Six. C-101	695	131	131	7000	2450	B 5.50/20	P 30x5	Con S4		6-3 1/2 x 4	235.0	28.9	50-2200	L	2 1/2	4	PP	No	Zen	D-R	D-R	D-R	44	
43	Witt-Will. S15B	2100	147	10500	4500	P 30x5	DP30x5	Wau MS		6-3 1/2 x 4	248.2	27.3	66-3200	L	2 1/2	4	PP	No	Zen	D	D-R	D-R	45		
44	Witt-Will. CG4C	2200	158	10500	5170	P 30x5	DP30x5	Bud KBU-I		4-4x5	263.9	25.6	43-2000	L	2 1/2	4	PP	No	Zen	V	R-B0	1	46		
45	Douglas. C4	3195	156	160	12500	5100	P 32x6	P 34x7	Bud KBU-I		4-4x5	263.9	25.6	43-2000	L	2 1/2	4	PP	No	Zen	V	E-L	N-L	47	
46	Douglas. C6	3320	160	1550	5850	P 32x6	P 34x7	Bud DW-6		6-3 1/2 x 4	331.3	33.7	73-2400	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	48		
47	Douglas. Duplex. S	3600	160	12500	5600	P 32x6	P 36x8	Bud DW-6		6-3 1/2 x 4	330.0	33.7	61-2100	L	2 1/2	4	PP	No	Zen	V	D-R	D-R	49		
48	Fageol. 1-18-A	1280	140	170	4594	B 7.50/20	DP32x6	Con 16C		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	A-L	A-L	50		
49	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau TL		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	51	
50	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	52	
51	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	53	
52	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	54	
53	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	55	
54	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	56	
55	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-2700	L	2 1/2	4	PP	No	Zen	V	E-L	N-E	57	
56	Fisher-Stand. A-2	3840	146	170	11000	4300	P 32x6	P 34x7	Wau MS		6-3 1/2 x 4	225.0	27.3	65-27											

Line Number	Radiator Make	Clutch	Gearset			Rear Axle			Front Axle			Brakes			Frame			Body Mounting Data			Springs			Line Number			
			Type and Make	Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and No.	Make and Model	Final Drive and Type	Gear Ratios	Drive and Torque	Reduc. in High	Reduc. in Low	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type	
1	Lon	D.	Mun	A-4J	U	4	No	Spi	Tim 5261	S <sub>1</sub> /2	H	5.83	29.6	Tim 11710	B4IM	377	TX	Jac	6x2 <sub>1</sub> 4x <sub>1</sub>	P	87	4C	34	38x2	50 <sub>1</sub> 4x2 <sub>1</sub>	N	1
2	Per	D.Own	Cov A-4J	U	4	No	Blo	Tim 54000H	BF	H	5.83	37.1	Col 4003	LAIH	278	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	94	66 <sub>1</sub>	34	40x2	54x2 <sub>1</sub>	N	2	
3	Own	D.Ful	Ful DU-10	U	3	No	Blo	Tim 52200H	BF	H	5.83	34.8	Tim 11703H	LAIH	230	TX	Ros	5 <sub>1</sub> 2x2 <sub>1</sub> 4x <sub>1</sub>	C	97	57 <sub>1</sub>	30 <sub>1</sub>	38x2	50x2 <sub>1</sub>	N	3	
4	You	D.B-L	B-L 214	U	4	No	Spi	Tim 52000H	BF	R	5.8	37.4	Tim 12703H	LAIH	308	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	118 <sub>1</sub>	73 <sub>1</sub>	34	42x2	50x2 <sub>1</sub>	N	4	
5	Chi	D.B-L	B-L 20	U	4	No	Blo	Tim 52000	BF	R	5.8	...	Tim 11703	LAIH	380	TX	Ros	5 <sub>1</sub> 2x2 <sub>1</sub> 4x <sub>1</sub>	C	110	34	41x2	50x2 <sub>1</sub>	N	5		
6	Chi	D.B-L	B-L 35	U	4	No	Blo	Tim K	BF	R	5.5	26.4	...	LAIH	432	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	100	66	34	41x2	50x2 <sub>1</sub>	N	6	
7	McC	P.B&B	B-L	U	3	No	Spi	Cla	S <sub>1</sub> /2	H	5.5	26.4	Shu	K2IM	342	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	94	54	34	40x2	54x2 <sub>1</sub>	N	7	
8	Lon	P.B&B	B-L	U	4	No	Spi	3	Cla	S <sub>1</sub> /2	H	5.5	12.9	Col 4003	C4IM	300	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	114	32	40x2	46x2 <sub>1</sub>	N	8	
9	Lon	Roc	M.M.	U	2	No	Spi	700	S <sub>1</sub> /2	H	5.5	29.7	Col 4003	E4IM	292	21	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	97	53	32	40x2	54x2 <sub>1</sub>	N	9	
10	Lon	P.Own	Own	U	2	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.5	26.6	Eat 100	E4IM	346	21	CAS	6x2 <sub>1</sub> 4x <sub>1</sub>	P	84	34	38x2	52x3	N	10	
11	Per	E.Own	Own	U	2	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	22.6	Eat 430 F	E4IM	346	21	CAS	6x2 <sub>1</sub> 4x <sub>1</sub>	P	104	61 <sub>1</sub>	34	32x2	52x3	N	11
12	Per	E.Own	Own	U	2	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	22.6	Eat 430 F	E4IM	346	21	CAS	6x2 <sub>1</sub> 4x <sub>1</sub>	P	104	61 <sub>1</sub>	34	42x2	52x3	N	12
13	Per	P.Own	Own	U	2	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	22.6	Eat 430 F	E4IM	346	21	CAS	6x2 <sub>1</sub> 4x <sub>1</sub>	P	104	61 <sub>1</sub>	34	42x2	52x3	N	13
14	Per	P.Own	W-G T7	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	42.9	Own 200	B4IM	295	21	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	98	55	32	40x2	52x2 <sub>1</sub>	N	14
15	Per	P.B-L	B-L 214	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.4	Tim 12703H	LAIH	290	TD	Ros	5 <sub>1</sub> 2x2 <sub>1</sub> 4x <sub>1</sub>	P	126	82	34	39x2	52x3	N	15
16	Per	D.B-L	B-L 20	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	36.1	Tim 12703H	LAIH	448	TX	Ros	5 <sub>1</sub> 2x2 <sub>1</sub> 4x <sub>1</sub>	C	100	64	34	38x2	52x3	N	16
17	O&O	P.B&B	W-O-BB	U	4	No	Spi	3	Cla	S <sub>1</sub> /2	H	5.6	35.8	Tim 11703H	LAIH	279	FD	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	111	62 <sub>1</sub>	34	38x2	57 <sub>1</sub> 4x2 <sub>1</sub>	N	17
18	Mod	D.B-L	B-L 31	U	3	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	38.0	Tim 12703H	LAIH	452	TD	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	P	84	33	38x2	50x2 <sub>1</sub>	N	18	
19	Per	D.B-L	B-L 214	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.4	Tim 11703H	LAIH	63x3 <sub>1</sub>	TD	Ros	6x3x4	P	107	34	38x2	54x2 <sub>1</sub>	N	19	
20	Per	D.B-L	B-L 214	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.4	Tim 11703H	LAIH	354	FX	Own	7x3x4	C	117 <sub>1</sub>	74 <sub>1</sub>	32	42x2	54x2 <sub>1</sub>	N	20
21	Own	D.Own	Own BG	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	40.2	Own BG	O4IV	354	FX	Own	7x3x4	C	96	54 <sub>1</sub>	34	42x2	54x3	N	21
22	Chi	D.B-L	B-L 214	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	6.6	43.6	Tim 12703H	LAIH	380	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	128	81	34	37 <sub>1</sub> 4x2 <sub>1</sub>	50x2 <sub>1</sub>	N	22
23	Lon	D.B-L	B-L 35	U	4	No	Blo	30	2R	2R	6.6	45.5	Tim 12703H	LAIH	144	TD	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	31 <sub>1</sub> 2	40x2	N	23	
24	Lon	P.B-L	B-L 20	U	4	No	Blo	30	2R	2R	6.6	30.0	Col 5530	LAIH	259	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	31 <sub>1</sub> 2	40x2	N	24	
25	Own	D.B-L	B-L 20	U	4	No	Cle	Own	S <sub>1</sub> /2	H	5.6	34.3	Own	LAIH	259	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	31 <sub>1</sub> 2	40x2	N	25	
26	Own	D.B-L	B-L 20	U	4	No	Cle	Own	S <sub>1</sub> /2	H	5.6	34.3	Own	LAIH	259	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	31 <sub>1</sub> 2	40x2	N	26	
27	Own	D.B-L	B-L 20	U	4	No	Cle	Own	S <sub>1</sub> /2	H	5.6	34.3	Own	LAIH	259	TX	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	31 <sub>1</sub> 2	40x2	N	27	
28	Fed	D.B-L	B-L 20	U	3	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.1	Eat 12703H	LAIH	452	TX	Ros	6x3x4	P	110	66	34	41x2	50x2 <sub>1</sub>	N	28
29	You	D.B-L	B-L 35	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.1	Eat 12703H	LAIH	452	TD	Ros	6x3x4	P	110	66	34	41x2	50x2 <sub>1</sub>	N	29
30	Own	D.B-L	B-L 20	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.1	Eat 12703H	LAIH	452	TD	Ros	6x3x4	P	110	66	34	41x2	50x2 <sub>1</sub>	N	30
31	Own	D.B-L	B-L 20	U	4	No	Spi	5.5	E4IM	S <sub>1</sub> /2	H	5.6	37.1	Eat 12703H	LAIH	452	TD	Ros	6x3x4	P	110	66	34	41x2	50x2 <sub>1</sub>	N	31
32	Lon	D.B-L	B-L 35	U	4	No	Blo	Tim 63702	WF	R	6.5	34.8	Tim 14704H	LAIH	460	2IM	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	41x2	50x2 <sub>1</sub>	N	32	
33	Per	D.B-L	B-L 214	U	4	No	Blo	Tim 65000H	WF	R	6.5	75.1	Tim 15302	T2IM	224	4H	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	41x2	50x2 <sub>1</sub>	N	33	
34	Per	D.B-L	B-L 35	U	4	No	Blo	Tim 65000H	WF	R	6.5	75.1	Tim 15302	T2IM	224	4H	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	41x2	50x2 <sub>1</sub>	N	34	
35	Per	D.B-L	B-L 35	U	4	No	Blo	Tim 65000H	WF	R	6.5	75.1	Tim 15302	T2IM	224	4H	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	41x2	50x2 <sub>1</sub>	N	35	
36	Per	D.B-L	B-L 35	U	4	No	Blo	Tim 65000H	WF	R	6.5	75.1	Tim 15302	T2IM	224	4H	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	41x2	50x2 <sub>1</sub>	N	36	
37	Per	D.B-L	B-L 35	U	4	No	Blo	Tim 65000H	WF	R	6.5	75.1	Tim 15302	T2IM	224	4H	Ros	6x2 <sub>1</sub> 4x <sub>1</sub>	C	133 <sub>1</sub>	83	34	41x2	50x2 <sub>1</sub>	N	37	
38	Per	D.B-L	B-L 35	U	4	No	Blo	Tim 65000H	WF	R	6.5	75.1															

Line Number	Make, Model and Capacity	General			Tire Size		Make and Model	Engine			Fuel System	Electrical System					
		Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)		Number of Cylinders Bore and Stroke	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Piston Displacement	Valve Arrangement	Camshaft Drive	Piston Material	Carburetor Make	Ignition System Make	Generator, Starter Make
<b>2 Ton—Cont'd</b>																	
1	Pierce-Arrow.....XA 3500	150	162	6280	S 36x4 <sup>0</sup>	DS36x5 <sup>0</sup>	Own XA	4-4x5 <sup>1</sup> <sub>2</sub>	276.5	25.6	200.6	21 <sup>1</sup> <sub>2</sub>	21 <sup>1</sup> <sub>2</sub>	FP	Str	D-R	
2	Pierce-Arrow.....FA 2450	140	180	3855	P 32x6	S 34x7	Own FA	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	298.6	29.4	221.6	27.3	220.0	LG G	FP	D-R	
3	Relay.....40	3240	168	185	5500	P 36x6	Bud DS6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	209.6	21.5	231.0	27.3	220.0	LG G	FP	A-L	
4	Relay.....S11 2030	162	185	4700	P 32x6	DP32x6	Bud HS6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	241.6	27.3	220.0	LG G	PC	No			
5	Relay.....50	3860	161	6800	P 36x6	DP36x6	Bud DW6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	231.0	32.7	73-2800	LG G	PC	No			
6	Reo.....FC 1645	152	168	4025	P 32x6	DP32x6	Own	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	226.5	27.3	67-2800	LG G	PC	Sch			
7	Reo.....FD 1745	168	174	4075	P 32x6	DP32x6	Own	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	236.5	27.3	67-2800	LG G	PC	Sch			
8	Reo.....FH 1545	142	168	4165	P 32x6	DP32x6	Own	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	226.5	27.3	67-2800	LG G	PC	Sch			
9	Schacht De Luxe.....20	160	174	9500	4500 B 7.50/20	Own 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248.5	32.7	65-2500	LG G	PC	Sch				
10	Selden.....Unit 37	151	181	10000	4700 P 32x6	DP32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	216.1	27.3	65-2700	LG G	PC	Sch			
11	Service.....40	340	185	4900	P 36x6	DP36x6	Bud DS6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	209.6	31.5	56-2000	LG G	PC	Sch			
12	Sterling.....DB9-64	139	168	9000	3625 P 34x7	P 34x7	Bud HS6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	228.2	27.3	63-2500	LG G	PC	Sch			
13	Stewart.....S-50	145	176	10235	4450 P 32x6	DP32x6	Lye ASA	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	209.6	31.5	56-2000	LG G	PC	Sch			
14	Stewart.....29X5	1695	145	3895	3150 B 6.50 20	Own	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	205	25.4	68-3200	LG G	PC	Sch				
15	Studebaker.....C2B	1250	150	5276	5610 P 32x6	P 32x6	Own GR	4-4x5 <sup>1</sup> <sub>2</sub>	289	23.6	45-1600	LG G	PC	Sch			
16	White.....5-50	175	175	3125	1745 P 32x6	P 32x6	Wau XKC	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	33.7	60-3200	LG G	PC	Sch				
17	Wichita.....C2B	2450	158	5400	5610 P 32x6	P 32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248	27.3	66-3200	LG G	PC	Sch			
18	Witt-Will.....C3W 20	150	188	12500	5400 P 32x6	P 32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248	27.3	66-3200	LG G	PC	Sch			
19	Witt-Will.....R2B	158	188	12500	5820 P 32x6	P 32x6	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Sch			
20	Witt-Will.....R2	158	188	13200	5800 P 32x6	DP32x6	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Sch			
21	Witt-Will.....R2	158	188	13200	5800 P 32x6	DP32x6	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Sch			
<b>2½ Ton</b>																	
22	Acme.....56 Spec	3577	178	Op 13850	7050 P 34x7	DP34x7	Con 18R	6-4x4 <sup>1</sup> <sub>2</sub>	339.3	38.4	82-2400	LG G	PC	Str			
23	Acme.....52	3770	186	Op 14550	7150 P 34x7	DP34x7	Con 18 R	6-4x4 <sup>1</sup> <sub>2</sub>	339.3	38.4	82-2400	LG G	PC	Str			
24	Amer. LaF...Chief 9R	3900	180	Op 12700	6400 P 34x7	DP34x7	Own	6-3 <sup>1</sup> <sub>2</sub> x5	331.0	33.7	65-2100	LG G	PC	Str			
25	Atterbury.....H	173	199	14390	6700 P 32x6	DP32x6	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Str			
26	Autocar.....D	3500	150	192	5300 P 34x7	DP34x7	Wau ML	6-4x4 <sup>1</sup> <sub>2</sub>	358.0	35.4	82-2400	LG G	PC	Str			
27	Available.....T-30	140	160	16000	6500 P 34x7	DP34x7	Wau MK	6-4x4 <sup>1</sup> <sub>2</sub>	380.9	40.8	87-2500	LG G	PC	Str			
28	Available T-37, T-38V	140	160	16000	7500 P 34x7	DP34x7	Con	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Str			
29	Rockway.....140	156	185	17000	6200 P 32x6	DP32x6	Her	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Str			
30	Rockway.....141-6	170	200	17000	6200 P 32x6	DP32x6	Con	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Str			
31	Rockway.....170	170	200	17000	6500 P 32x6	DP32x6	Wau 6ML	6-4x4 <sup>1</sup> <sub>2</sub>	380.9	40.8	89-2400	LG G	PC	Str			
32	Chicago.....1-24-A	154	202	5773	5773 P 36x8 <sup>0</sup>	DP36x8 <sup>0</sup>	Wau 6ML	6-4x4 <sup>1</sup> <sub>2</sub>	311.0	33.4	75-20/20	LG G	PC	Str			
33	Coleman.....C30	120	144	7700 P 36x8	DP36x8	Wau 6ML	6-4x4 <sup>1</sup> <sub>2</sub>	311.0	27.3	52-2200	LG G	PC	Str				
34	Commerce.....56	4580	175	192	7000 P 36x6	DP36x6	Bud BA-6	6-4x4 <sup>1</sup> <sub>2</sub>	310.9	40.8	73-2000	LG G	PC	Str			
35	Commerce.....60	4580	175	192	7000 P 36x6	DP36x6	Bud DS6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	309.3	31.5	56-2000	LG G	PC	Str			
36	Commerce.....64	3240	168	185	5100 P 36x6	DP36x6	Bud DS6	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	309.3	31.5	56-2000	LG G	PC	Str			
37	Corbitt.....2½-3 T	1586	174	17420	15500 P 34x7	DP34x7	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Str			
38	Corbitt.....2½-3 T	1586	174	17420	15500 P 34x7	DP34x7	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	72-2400	LG G	PC	Str			
39	Day Elder.....130	2895	150	204	30000 P 36x8 <sup>0</sup>	DP36x8 <sup>0</sup>	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311.0	33.4	75-20/20	LG G	PC	Str			
40	Diamond T.....551	251	168	186	16000 P 32x6	DP32x6	Wau XWC	6-4x4 <sup>1</sup> <sub>2</sub>	339	38.4	75-2400	LG G	PC	Str			
41	Diamond T.....506	2820	172	188	16000 P 34x7	DP34x7	Her WXC	6-4x4 <sup>1</sup> <sub>2</sub>	339	38.4	75-2400	LG G	PC	Str			
42	Douglas.....CD4	3815	190	Op 17500	5860 P 34x7	P 36x8	Bud BUFI	6-4x4 <sup>1</sup> <sub>2</sub>	312.0	28.9	49-1900	LG G	PC	Str			
43	Douglas.....CD6	3940	190	Op 17500	5860 P 34x7	P 36x8	Bud DW6	6-4x4 <sup>1</sup> <sub>2</sub>	331.3	33.7	73-2400	LG G	PC	Str			
44	Fageol.....250	2950	175	197	12500 P 32x6	DP32x6	Wau X	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	298	33.7	67-2600	LG G	PC	Str			
45	Federal.....A67	2185	151	176	13000 P 32x6	DP32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248	27.3	44-2500	LG G	PC	Str			
46	Federal.....A67W	2360	151	176	13000 P 32x6	DP32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248	27.3	44-2500	LG G	PC	Str			
47	Fisher-Stand. Mer. Ex.	146	160	12000	4300 P 32x6	DP32x6	Con S4	4-4x4 <sup>1</sup> <sub>2</sub>	253.5	28.9	50-2200	LG G	PC	Str			
48	Fisher-Stand. Mer. Ex.	146	160	12000	4200 P 32x6	DP32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248.2	27.3	44-2500	LG G	PC	Str			
49	Fisher-Stand. H. D.	155	206	16000	6000 P 32x6	DP32x6	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	73-2400	LG G	PC	Str			
50	F.W.D.....HHS 4000	133	160	12500	6000 P 32x6	DP32x6	Wau HHS	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	309	31.5	56-2000	LG G	PC	Str			
51	Garford.....40	3240	168	185	5100 P 36x6	DP36x6	Bud DS6	6-4x4 <sup>1</sup> <sub>2</sub>	310	31.5	56-2000	LG G	PC	Str			
52	Garford.....60	4580	175	192	7000 P 36x6	DP36x6	Bud BA-6	6-4x4 <sup>1</sup> <sub>2</sub>	410.9	40.8	73-2000	LG G	PC	Str			
53	Gen. Mot. T-42-4201(x)	1845	141	181	12000 P 32x6	DP32x6	Buick	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	257.5	28.3	76-2500	LG G	PC	Str			
54	Gramm.....D	160	196	14000 P 32x6	DP32x6	Lye TS	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	33.5	38.6	90-2200	LG G	PC	Str				
55	Gramm-Bernstein B/X	145	185	12500 P 32x6	DP32x6	Con 16C	6-3 <sup>1</sup> <sub>2</sub> x5 <sup>1</sup> <sub>2</sub>	248.3	27.3	67-2400	LG G	PC	Str				
56	Gramm-Bernstein B/X	144	184	12500 P 32x6	DP32x6	Con 16R	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	73-2400	LG G	PC	Str				
57	Gramm-Bernstein D	152	212	15500 P 32x6	DP32x6	Her	6-4x4 <sup>1</sup> <sub>2</sub>	311	38.4	73-2400	LG G	PC	Str				
58</																	

Line Number	Radiator Make	Clutch	Gear Set	Make and Model	Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and No.	Rear Axle				Front Axle	Brakes	Frame	Springs		Auxiliary Type	Line Number							
									Final Drive and Type		Gear Ratios	Reduce, in High	Reduce, in Low	Make and Model		Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Width of Frame			
									Drive and Torque	Reduc.	High	Low	Make and Model	Service												
1	Own	D. Own	B-L	Own XA	A	4		Spl	Own XA	W 1/2	8.5	44.2	Own XA	Own	Gem	125 1/2	72 1/2			1						
2	Fed	P. B&B	B-L	Own XA	A	3		Spl	Tim	W 1/2	5.28	33.3	Own XA	Own	Han	106 1/2	52 1/2			2						
3	Own	D. B-L	B-L	35	U	4		Blo	Own 30	2R	4.65	34.5	Tim 14704 H	Own	Han	144 1/2	52 1/2			3						
4	Own	D. B-L	B-L	20	U	4		Blo	Own 20	2R	6.00	30.0	Col 5530	Own	Han	133 1/2	83			4						
5	Own	D. B-L	B-L	51-5	U	5		Blo	Own 60	2R	7.88	58.5	Tim 14704 H	Own	Han	133 1/2	82			5						
6	Own	D. B-L	Own		U	4		Cle	Own	S 1/2	5.7	37.6	Own	L41H	Ros	6 1/2 x 3 1/2 x 1/2	111 1/2	67 1/2	40 1/2	38 x 2 1/2	50 x 2 1/2	6				
7	Own	D. B-L	Own		U	4		Cle	Own	S 1/2	5.7	37.6	Own	L41H	Ros	6 1/2 x 3 1/2 x 1/2	127 1/2	83	40 1/2	38 x 2 1/2	50 x 2 1/2	7				
8	Own	D. B-L	Own		U	4		Cle	Own	S 1/2	5.7	37.6	Own	L41H	Ros	6 1/2 x 3 1/2 x 1/2	87 1/2	57 1/2	40 1/2	38 x 2 1/2	50 x 2 1/2	8				
9	Own	D. B-L	B-L	35	U	4		Spl	Tim 54000 H	BF	5.33	31.2	Tim 12703 H	Tim	452	TX	Ros	6x3x3 1/2	31 1/2	40x2 1/2	50x3	NN	9			
10	Own	D. B-L	B-L	35	U	4		Blo	Tim 54200 H	BF	6.5	34.8	Tim 14704 H	Tim	12703 H	L41H						10				
11	Own	D. B-L	B-L	20	U	4		Blo	Tim 54000	BF	6.5	29.2	Col 5530	Tim	12703 H	L41H						11				
12	Own	D. B-L	B-L	20	U	4		Spl	Tim 54000 H	BF	6.5	34.8	Tim 14704 H	Tim	12703 H	L41H						12				
13	Per	D. B-L	B-L	35	U	4		Spl	Tim 54000	BF	6.5	34.8	Tim 14704 H	Tim	12703 H	L41H						13				
14	Own	D. B-L	B-L	35	U	4		Spl	Tim 54000	BF	6.5	34.8	Tim 14704 H	Tim	12703 H	L41H						14				
15	McC	D. Ful	WGASL-T9	U	4			Spl	Tim 54200-A1	BF	6.5	37.4	Tim	12703 H	L41H						15					
16	Own	P. Own	OwnGRBB	U	4			Spl	Own 56	S 1/2	6.33	26.7	Own 3DI	O21M	268	EX	Own	6 1/2 x 3 1/2 x 1/2	119 1/2	81 1/2	41 1/2	42 1/2	47 1/2	16		
17	You	D. B-L	B-L	35	U	4		Spl	Own 30R	WF	6.5	34.8	Shu 5550	O21MV	342	RI	Own	7x2 1/2 x 1/2	78	20	40x2 1/2	54x3	NN	17		
18	Per	D. B-L	B-L	35-4	U	4		Spl	Tim 56000 H	BF	6.8	36.4	Tim 14703 H	L41H	578	TX	Ros	6x2 1/2 x 1/2	79 1/2	32	41x2 1/2	54x3	NN	18		
19	Per	D. B-L	B-L	35-4	U	4		Spl	Tim 56000 H	BF	6.8	28.3	Tim 14703 H	L41H	578	TX	Ros	6x2 1/2 x 1/2	76	32	41x2 1/2	54x3	NN	19		
20	Per	D. B-L	B-L	35-4	U	4		Spl	Tim 56000 H	WF	6.0	32.1	Tim 14703 H	L41H	578	TX	Ros	6x2 1/2 x 1/2	76	32	41x2 1/2	54x3	NN	20		
21	Per	D. B-L	B-L	35-4	U	4		Spl	Tim 56720 H	WF	6.0	32.1	Tim 14703 H	L41H						21						
22	Per	D. B-L	B-L	55-7	A	7		Blo	Tim 65200H	WF	7.75	73.5	Tim 15733 H	L41H	659	2RI	Ros	6x3 1/2 x 1/2	P 154	88	34	40x2 1/2	54x3	NN	22	
23	Per	D. B-L	B-L	60-4	A	4		Blo	Tim 65706DH	WF	7.75	41.5	Tim 15733 H	L41H	766	2RI	Ros	7x3 1/2 x 1/2	C 156	96 1/2	34	40x2 1/2	54x3	NN	23	
24	G&P	P. B&B	Own		A	4		Spl	Tim 65000BX	WF	6.0	28.8	Tim 14703BX	L41H	61	TD	Opt	32	42x2 1/2	54x3	NN	24				
25	You	D. B-L	B-L	51	U	4		Spl	Tim 55000 H	BF	6.6	36.7	Tim 14703 H	L41H	136	TX	Gem	90 1/2	34	41 1/2	54x3 1/2	NN	25			
26	Per	P. Lon	B-L	51	U	4		Spl	Own SD	BF	6.6	32.7	Tim 14703	L41H	460	2IM	Ros	6 1/2 x 3 1/2 x 1/2	C 148 1/2	63 1/2	34	40x2 1/2	54x3	NN	26	
27	You	D. B-L	B-L	51	U	4		Spl	Tim 58200H	WF	7.5	41.7	Shu 5572	L41H		TD	Opt	32	40x2 1/2	50x3	NN	27				
28	You	D. B-L	B-L	51	U	4		Spl	Tim 65001	WF	7.5	40.0	Shu 5572	L41H	386	CD	Ros	7 1/2 x 3 1/2 x 1/2	T 108	59	34	40x2 1/2	54x3	NN	28	
29	G&O	D. B-L	B-L	51	U	4		Spl	Wls 3	2F	6.6	35.3	Shu	L41H		CD	Ros	7 1/2 x 3 1/2 x 1/2	T 142	84	34	40x2 1/2	54x3	NN	29	
30	G&O	D. B-L	B-L	51	U	4		Spl	Wls 3	2F	7.0	30.0	Shu	L41H		CD	Ros	7 1/2 x 3 1/2 x 1/2	T 142	84	34	40x2 1/2	54x3	NN	30	
31	G&O	D. B-L	B-L	51	U	4		Spl	Wls 3	2F	6.4	31.0	Shu	L41H		CD	Ros	7 1/2 x 3 1/2 x 1/2	T 142	84	34	40x2 1/2	54x3	NN	31	
32	G&O	D. B-L	B-L	51	U	4		Spl	Wls 3	2F	7.0	30.0	Shu	L41H		CD	Ros	7 1/2 x 3 1/2 x 1/2	T 142	84	34	40x2 1/2	54x3	NN	32	
33	Chi	D. B-L	B-L	35	U	4		Spl	Tim 58000H	BF	6.8	36.7	Tim 15733 H	L41H	381	TX	Ros	7x4x4	T 78	30	34 1/2	42 1/2	54x3 x 3	33		
34	Per	D. Ful	Ful G14	U	8			Spl	Tim 58000H	BF	6.8	36.7	Tim 15733 H	L41H		FD						34				
35	Lon	D. Ful	Ful	U	5			Blo	Tim 65706Dh	WF	8.5	63.0	Tim 15733 H	L41H	660	TX	Ros	7x3 1/2 x 1/2	T 144	88	34	40x2 1/2	54x3	NN	35	
36	Lon	D. B-L	B-L	35	U	5		Blo	Tim 63702	WF	6.5	34.8	Tim 14704 H	L41H	660	TX	Ros	7x3 1/2 x 1/2	T 144	97	34	40x2 1/2	54x3	NN	36	
37	Per	P. B-L	B-L	314	U	4		Spl	Tim 58200	BF	6.8	40.7	Tim 14703 H	L41H	354	TX	Ros	7x4x4	C 108 1/2	62 1/2	34	42x2 1/2	56x3	NN	37	
38	Per	P. B-L	B-L	314	U	4		Spl	Tim 65200	WF	6.8	40.7	Tim 14703 H	L41H	390	TD	Ros	6 1/2 x 3 1/2 x 1/2	C 138	84	34	40x2 1/2	56x3	NN	38	
39	Per	D. Cov	Cov	U	4			Spl	Tim 55000H	SF	6.6	40.7	Tim 14703 H	L41H	530	CX	Ros	7x2 1/2 x 1/2	T 192	104	31	46x2 1/2	54x3	NN	39	
40	G&O	D. Cov	Cov	U	4			Spl	Tim 55000H	SF	6.6	40.7	Tim 14703 H	L41H	530	CX	Ros	7x2 1/2 x 1/2	T 192	104	31	46x2 1/2	54x3	NN	40	
41	G&O	D. Cov	Cov	U	4			Spl	Tim 55000H	BF	6.6	40.7	Tim 14703 H	L41H	530	CX	Ros	6x3x4	C 167 1/2	99 1/2	34	41x2 1/2	56x3	NN	41	
42	Own	D. Ful	FulMGU14	U	4			Spl	Tim 50000 H	WF	4.88	20.9	Tim 14703 H	L41H	524	TX	Ros	6x3 1/2 x 1/2	C 119 1/2	71	34	40x2 1/2	51 1/2 x 3	NN	42	
43	Per	P. B-L	B-L	314	U	4		Spl	Tim 50000 H	WF	4.88	20.9	Tim 14703 H	L41H	524	TX	Ros	6x3 1/2 x 1/2	C 107	59	34	40x2 1/2	51 1/2 x 3	NN	43	
44	Per	P. B-L	B-L	314	U	4		Spl	Tim 50000 H	WF	4.88	20.9	Tim 14703 H	L41H	524	TX	Ros	7x2 1/2 x 1/2	T 120	77 1/2	34	42x2 1/2	54x3	NN	44	
45	Lon	D. B-L	B-L	35	U	4		Spl	Tim 50000 H	WF	6.5	33.0	Tim 15733 H	L41H	524	TX	Ros	6 1/2 x 3 1/2 x 1/2	C 120	79	32	43x2 1/2	54x3	NN	45	
46	Lon	D. B-L	B-L	35	U	4		Spl	Tim 50000 H	WF	6.5	33.0	Tim 15733 H	L41H	524	TX	Ros	6 1/2 x 3 1/2 x 1/2	C 120	79	32	43x2 1/2	54x3	NN	46	
47	Lon																									

Line Number	Make, Model and Capacity	General			Tire Size		Engine			Fuel System		Electrical System													
		Chassis Price	Standard W.R.	Man. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Rear	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement	Camshaft Drive	Piston Material	Length Main Bearings	Main Bearings	No. Main Bearings	Oiling System	Carburetor Make	Fuel Feed	Ignition System	Generator, Starter Make	Line Number	
3 Ton—Cont'd																									
1 Chicago . . . 1-26-A2 1/2-3	154	202	5928	B 7.50/20	DB7.50/20	Wau 6ML	6-4x4 1/2	358	38.4	77-2200	L G C	2 1/2	12 1/2	7 FP	Wa	Zen	M A-L	A-L							
2 Clinton . . . 65	184	Op 14500	5925	S 34x5°	DS34x5°	Bud ETU	4-4 1/2 x 5 1/2	312.0	28.9	49-1900	L G C	2 1/2	10 1/2	3 FP	Bu	Zen	M A-Spl	D-R							
3 Clinton . . . 65-6	154	14500	5925	P 38x7	DP38x7	Bud DW 6	6-3 1/2 x 5 1/2	330.0	33.7	73-2400	L G C	2 1/2	9	3 FP	No	Str	M D-R	D-R							
4 Coleman . . . D40	130	180	16600	8500	P 40x8	Bud DW 6	6-3 1/2 x 5 1/2	330.0	33.7	72-500	L G C	2 1/2	9	4 FP	Bu	Zen	M A-L	A-L							
5 Commerce . . . 60	4680	175	17100	7100	P 36x6	DP38x7	Bud DW 6	6-4 1/2 x 5 1/2	410.0	49.0	48-7300	L G C	2 1/2	9	4 FP	No	Str	M D-R	D-R						
6 Concord . . . JX-6	4200	154	174	17200	6700	P 34x7	DP34x7	Bud DW 6	6-3 1/2 x 5 1/2	390.0	33.7	73-2400	L G C	2 1/2	9	4 FP	No	Str	M A-L	A-L					
7 Corbitt 3-4-T . . . 18W6	178	230	19000	6780	P 38x8	DP38x8	Con 18R	6-4 1/2 x 5 1/2	400.0	49.0	48-8200	L G C	2 1/2	9	4 FP	No	Str	M D-R	D-R						
8 Diamond T . . . T-200	2925	167	16080	6400	P 8.25/20	DP38x8	Her YXC	6-3 1/2 x 5 1/2	382.0	49.0	48-2200	L G C	2 1/2	9	4 FP	No	Str	M A-L	A-L						
9 Diamond T . . . T-200	606	167	242	19000	P 36x5	DP36x8	Her YXC	6-3 1/2 x 5 1/2	328.0	49.0	48-2200	L G C	2 1/2	9	4 FP	No	Str	M D-R	D-R						
10 Diamond T . . . T-200	606	167	242	19000	P 36x5	DP36x8	Own	6-3 1/2 x 5 1/2	309.6	31.5	96-3000	L G C	2 1/2	11 1/2	7 FP	Ha	Zen	M D-R	D-R						
11 Dodge Bros . . . F-60	2845	146	18979	5543	P 32x6	DP32x6	Own	6-3 1/2 x 5 1/2	309.6	31.5	96-3000	L G C	2 1/2	11 1/2	7 FP	Ha	Zen	M D-R	D-R						
12 Dodge Bros . . . F-61	2575	170	170	19429	5831	P 32x6	DP32x6	Own	6-3 1/2 x 5 1/2	309.6	31.5	96-3000	L G C	2 1/2	11 1/2	7 FP	Ha	Zen	M D-R	D-R					
13 Dodge Bros . . . F-62	2695	195	195	19879	5901	P 32x6	DP32x6	Own	6-3 1/2 x 5 1/2	309.6	31.5	96-3000	L G C	2 1/2	11 1/2	7 FP	Ha	Zen	M D-R	D-R					
14 Douglas . . . D4	4010	186	Op 20000	6500	S 36x5°	S 36x10°	Bud YBU-I	4-4 1/2 x 6	281.0	32.4	50-1400	L G C	2 1/2	9	3 PC	Bu	Zen	M E	L-N						
15 Douglas . . . D6	4430	186	Op 20000	6800	P 36x6	DP38x7	Bud BA6	6-4 1/2 x 5 1/2	386.4	38.4	82-2300	L G C	2 1/2	9	4 PC	Bu	Zen	M E	L-N						
16 Douglas . . . D6	5500	216	22000	7560	P 38x7	DP40x8	Bud EBU-I	4-4 1/2 x 5 1/2	312.0	40.8	83-2100	L G C	2 1/2	10 1/2	3 PS	No	Zen	M E	L-N						
17 Duplex . . . FAC	4250	166	16000	7200	S 34x5	S 36x8	Bud BA6	6-4 1/2 x 5 1/2	312.0	40.8	78-2250	L G C	2 1/2	9	4 FP	No	Zen	M V	A-L						
18 Duplex . . . SAC	4750	166	16000	7400	S 34x5	S 36x8	Bud BA6	6-4 1/2 x 5 1/2	312.0	40.8	78-2250	L G C	2 1/2	9	4 FP	No	Zen	M V	D-R						
19 Fageol . . . 340	4750	182	200	18500	7820	P 36x6	DP36x6	Wau Cau	4-4 1/2 x 5 1/2	346.0	33.7	48-1700	L G C	2 1/2	9	3 PC	Wa	Zen	M V	D-R					
20 Fageol . . . 365	4200	182	200	15500	7250	P 36x6	DP36x6	Wau KU	6-4 1/2 x 5 1/2	404.0	38.4	82-2000	L G C	2 1/2	13 1/2	7 PC	Wa	Zen	M V	D-R					
21 Fageol . . . 370	5200	182	200	18500	8080	P 36x6	DP36x6	Wau SRL	6-4 1/2 x 5 1/2	462.0	43.3	89-2200	L G C	2 1/2	13 1/2	7 PC	Wa	Zen	M V	D-R					
22 Federal T10B 2 1/2-3 T	2740	165	201	16000	6550	P 34x7	DP34x7	Con 16R	6-4 1/2 x 6	311.0	38.4	75-2200	L G C	2 1/2	13 1/2	7 PC	KP	Zen	M M	D-R					
23 Federal T10W 2 1/2-3 T	2915	165	201	16000	6550	P 34x7	DP34x7	Con 16R	6-4 1/2 x 6	311.0	38.4	75-2200	L G C	2 1/2	13 1/2	7 PC	KP	Zen	M M	D-R					
24 Fisher-Stand . . . H-D	6	255	206	18000	6200	P 34x7	DP34x7	Con 18R	6-4 1/2 x 6	329.0	38.4	82-2400	L G C	2 1/2	13 1/2	7 PC	Co	Zen	M V	A-L					
25 Fisher-Stand . . . H-D	6	255	206	18000	6200	P 34x7	DP34x7	Con 18R	6-4 1/2 x 6	329.0	38.4	82-2400	L G C	2 1/2	13 1/2	7 PC	Co	Zen	M V	A-L					
26 Freedman . . . DW 144	4900	144	16000	7560	P 34x7	DP34x7	Bud DW 6	6-3 1/2 x 5 1/2	329.0	38.4	73-2400	L G C	2 1/2	13 1/2	7 PC	Co	Str	M V	A-L						
27 Freeman DW 188 3 1/2-T	5200	144	16000	7760	P 34x7	DP34x7	Bud DW 6	6-3 1/2 x 5 1/2	329.0	38.4	73-2400	L G C	2 1/2	13 1/2	7 PC	Co	Str	M V	A-L						
28 F.W.D. . . . 275	120	154	13960	6460	S 36x6	S 36x6	Own A	6-4 1/2 x 5 1/2	398.0	36.1	56-1350	L G C	2 1/2	12	3 PC	Pe	Str	M G	E						
29 Garford . . . 60	4680	154	13960	6460	S 36x6	S 36x6	Bud BA6	6-4 1/2 x 5 1/2	410.0	49.0	83-2300	L G C	2 1/2	12	3 PC	Pe	Str	M V	A-L						
30 Gen.Mot. T-44-4403(X)	3000	141	181	14000	5005	P 36x6	DP36x6	Buick	6-3 1/2 x 5 1/2	257.5	28.3	76-2500	L G C	2 1/2	12	3 PC	Ha	Zen	M M	D-R					
31 Gramm . . . E-330	160	196	16000	5500	B 25/20	DB8.25/20	Lyc TS	6-4 1/2 x 5 1/2	298.0	36.2	90-2200	L G C	2 1/2	13 1/2	7 PC	Co	Zen	M M	A-L						
32 Gramm . . . EY-190	190	190	16000	6750	B 50/20	DB7.50/20	Con 20-R	6-4 1/2 x 5 1/2	380.0	40.8	90-2200	L G C	2 1/2	13 1/2	7 PC	Co	Zen	M M	A-L						
33 Gramm . . . 35	153	200	15200	7200	S 36x5°	S 36x10°	Lyc TS	6-3 1/2 x 5 1/2	353.8	36.2	90-2200	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M M	A-L						
34 Gramm . . . 35 Lowbed	153	200	15200	7200	S 36x5°	S 36x10°	Con 18R	6-4 1/2 x 5 1/2	339.0	38.4	82-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
35 Gramm-Bernstein B6X	145	185	12500	4750	P 32x6	DP32x6	Con 16C	6-3 1/2 x 5 1/2	248.3	27.3	66-2900	L G C	2 1/2	13 1/2	7 FP	No	Zen	M V	A-L						
36 Gramm-Bernstein B6X	145	185	12500	4750	P 32x6	DP32x6	Con 16C	6-3 1/2 x 5 1/2	248.3	27.3	66-2900	L G C	2 1/2	13 1/2	7 FP	No	Zen	M V	A-L						
37 Gramm-Bernstein B6X	144	184	12500	4750	P 32x6	DP32x6	Con 16C	6-3 1/2 x 5 1/2	248.3	27.3	66-2900	L G C	2 1/2	13 1/2	7 FP	No	Zen	M V	A-L						
38 Gramm-Bernstein C6	150	201	15500	5920	S 36x4°	DS36x4°	Con 6B	6-3 1/2 x 5 1/2	331.4	33.7	70-2200	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
39 Gramm-Bernstein DX	125	212	15500	6600	P 34x7	DP34x7	Con 16R	6-4 1/2 x 5 1/2	311.0	38.4	73-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
40 Hahn . . . 47HB	151	155	18000	6850	P 34x7	DP34x7	Own FBB	6-3 1/2 x 5 1/2	300.0	40.3	76-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
41 Hug . . . 67	151	171	16500	5400	P 38x9	DP38x9	Her YXC	6-4 1/2 x 5 1/2	300.0	40.3	76-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
42 Indiana . . . 127AW	150	150	20000	7000	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	326.0	29.3	94-1600	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
43 Indiana . . . 175	150	150	20000	7500	P 34x7	DP34x7	Wis	6-4 1/2 x 5 1/2	377.0	38.4	72-2000	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
44 Indiana . . . 627AW	156	156	20000	7205	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	380.0	40.8	89-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
45 Indiana . . . 195	150	204	19500	6825	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	380.0	40.8	89-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
46 Indiana . . . 216	150	204	19500	6825	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	380.0	40.8	89-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
47 Indiana . . . 221	150	204	19500	6825	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	380.0	40.8	89-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
48 Indiana . . . 226	150	204	19500	6825	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	380.0	40.8	89-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
49 Indiana . . . 231	150	204	19500	6825	P 34x7	DP34x7	Con	6-4 1/2 x 5 1/2	380.0	40.8	89-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
50 International . . . A-5	150	210	15000	5606	P 34x7	DP34x7	Own FBB	6-3 1/2 x 5 1/2	300.0	40.3	82-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
51 International . . . A-6	150	210	15000	5756	P 34x7	DP34x7	Her YXC	6-4 1/2 x 5 1/2	300.0	40.3	82-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
52 Kenworth . . . 165	150	171	16500	5400	P 38x9	DP38x9	Con 18R	6-4 1/2 x 5 1/2	300.0	40.3	82-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L						
53 Kenworth . . . 184	3850	164	206	18500	7400	P 36x5	DP36x8	Her WXC	6-4 1/2 x 5 1/2	300.0	40.3	82-2400	L G C	2 1/2	13 1/2	7 PC	Ha	Zen	M V	A-L					
54 Kenworth . . . 185	4750	183	211	18500	7300	P																			

Line Number	Radiator Make	Clutch	Gear Set	Make and Model	Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and No.	Rear Axle			Front Axle	Brakes		Frame	Body Mounting Data		Springs		Auxiliary Type					
									Final Drive and Type				Gear Ratios			Make and Model		Service		Area Service Brakes					
									Drive and Torque	Reduce. in High	Reduc. in Low		Make and Model	Service	Hand	Dim. Side Rail	Type	Cab to Rear Axle	Front	Rear					
1 Chl	D.B-L	B-L 35	U	4 No	Spi 3	Tim 65001H	WF	R	7.75	41.5	Tim 15733H	L4IH	381	TX	Ros	7x4x14	T	33 1/2	41 1/2 x2 1/2	54 1/2 x3	1	1			
2 Per	D.B-L	B-L 55	U	4 No	Blo 4	T' 65706 HP	WF	R	8.50	45.5	Tim 15302	T21M	185	2I	Ros	8x3 1/2 x4	T	33 1/2	43 1/2 x3	51 1/2 x3	93	93			
3 Per	D.Ful	Ful RU 16	U	4 No	Blo 5	T' 65706 HP	WF	R	Opt	Opt	Tim 15382	255	TD	Ros	8x3 1/2 x4	T	98 1/2	33 1/2	43 1/2 x3	51 1/2 x3	94	94			
4 Per	D.Ful	Ful RU 16	U	5	Spi 5	Wls	2F	H	8.33	159	Wls	12x2 1/2 x4	TD	Ros	12x2 1/2 x4	C	144	89	97 1/2	48x3	48x3	95			
5 Lon	Ful	Ful RU 16	U	5	Blo	Tim 65706DH	WF	R	8.5	159	Wls	15300	H	TD	Ros	7x3x4	T	156	Opt	32 1/2	38 1/2 x2 1/2	50 3/4 x3	10		
6 Own	D.B-L	B-L 51	U	4 No	Blo	Tim 65706DH	WF	R	9.3	49.7	Tim 1533H	T21MV	520	TD	Ros	7x3x4	T	Opt	32 1/2	38 1/2 x2 1/2	50 3/4 x3	11			
7 Fed	D.B-L	B-L 55	U	4 No	Spi 3	Tim-Wls	2F	R	Opt	Opt	Tim 15733H	L4IH	768	TD	Ros	8x3 1/2 x4	T	132	34	40 1/2 x3	54x3	54x3			
8 G&O	D.Cov	Cov	U	4 No	Spi 3	Tim-Wls	2F	R	Opt	Opt	Tim 15733H	L4IH	768	TD	Ros	8x3 1/2 x4	T	126	89 1/2	45 1/2 x3	56x3	56x3			
9 G&O	D.Cov	Cov	U	4 No	Spi 3	Wls 69337L	2F	R	Opt	Opt	Tim 15733H	L4IH	478	TD	Ros	8x3 1/2 x4	T	150	99 1/2	45 1/2 x3	56x3	56x3			
10 G&O	D.Cov	Cov	U	4 No	Spi 3	Wls 69337L	2F	R	Opt	Opt	Tim 15733H	L4IH	478	TD	Ros	8x3 1/2 x4	T	149 1/2	69 1/2	42x3	56x3 1/2	56x3 1/2			
11 Lon	P.B&B	Own	U	4 No	Cle 3	Own	2F	SF	8.44	48	Own	L4IH	416	CD	Jac	10x3 1/2 x4	C	119	34	42x3	56x3 1/2	56x3 1/2			
12 Lon	P.B&B	Own	U	4 No	Cle 3	Own	2F	SF	7.12	48	Own	L4IH	416	CD	Jac	10x3 1/2 x4	C	149 1/2	89 1/2	42x3	56x3 1/2	56x3 1/2			
13 Lon	P.B&B	Own	U	4 No	Cle 3	Own	2F	SF	7.12	48	Own	L4IH	416	CD	Jac	10x3 1/2 x4	C	189 1/2	114 1/2	42x3	56x3 1/2	56x3 1/2			
14 Own	D.Ful	Ful RU 16	U	4	Blo 4	Wls 892A	2F	R	7.25	34	Shu 5550	W21MV	503	CX	Ros	8x2 1/2 x4	T	168	98	31	45x3	54x3			
15 Own	D.Ful	Ful RU 16	U	4	Blo 4	Wls 892A	2F	R	7.25	34	Shu 5550	W21MV	503	CX	Ros	8x2 1/2 x4	T	223	121	31	45x3	54x3			
16 Own	D.Ful	Ful HOG	U	8 A	Blo 4	Wls 1418	2F	R	8.18	67	Shu 615	W21MV	503	CX	Ros	10x2 1/2 x4	T	223	34	39x2 1/2	52x3	52x3			
17 Mod	D.B-L	B-L 51	U	5 No	Cle	Tim 65706	WF	R	8.5	45.5	Shu 5550	T21M	2	T	Ros	7x3 1/2 x4	C	172	101	41x3	56x3 1/2	56x3 1/2			
18 Mod	D.B-L	B-L 55	U	7 No	Cle	Tim 65706	WF	R	8.5	81	Shu 5550	T21M	2	T	Ros	7x3 1/2 x4	C	172	101	41x3	56x3 1/2	56x3 1/2			
19 Per	D.B-L	B-L 55 & 60	U	4 A3	Spi 4	Tim 65700	WF	R	7.75	41.5	Tim 15700 H	L4IH	659	T	Ros	7x3 1/2 x4	C	119	81	34	42x2 1/2	54x3			
20 Per	D.B-L	B-L 51	U	4 No	Spi 3	Tim 58000	WF	R	5.19	93	Tim 15300	T21MV	416	TD	Ros	7x3 1/2 x4	C	119	81	34	42x2 1/2	54x3			
21 Per	P.B-L	B-L 55&60	U	4 A3	Spi 4	Tim 58000	WF	R	6.82	44.5	Own	L4IH	659	T	Ros	7x3 1/2 x4	C	119	81	34	42x2 1/2	54x3			
22 Lon	P.B&B	Own	U	4 No	P-S 4	Tim 58200H	BF	R	6.75	49.5	Own	L4IH	659	T	Ros	6x2 1/2 x4	C	144	78 1/2	32	43x2 1/2	54x3			
23 Lon	P.B&B	Own	U	4 No	P-S 4	Tim 65200H	WF	R	6.75	49.5	Own	L4IH	659	T	Ros	6x2 1/2 x4	C	144	78 1/2	32	43x2 1/2	54x3			
24 Lon	D.B-L	B-L 51	U	5 No	Blo 4	Tim 65200H	WF	R	6.16	52	Tim 14703H	L4IH	577	TD	Ros	6x2 1/2 x4	C	144	78 1/2	32	43x2 1/2	54x3			
25 Lon	D.B-L	B-L 51	U	5 No	B-C	Own	2F	R	6.16	52	Tim 14703H	L4IH	577	TD	Ros	6x2 1/2 x4	C	144	78 1/2	32	43x2 1/2	54x3			
26 Lon	D.Ful	Ful RU 16	U	8 A2	B-C	Own	2F	R	Opt	Opt	Tim 14703H	L4IH	577	TD	Ros	6x2 1/2 x4	C	144	78 1/2	32	43x2 1/2	54x3			
27 Lon	D.Ful	Ful HU 16	U	8 A2	B-C	Own	2F	R	Opt	Opt	Tim 14703H	L4IH	577	TD	Ros	6x2 1/2 x4	C	144	78 1/2	32	43x2 1/2	54x3			
28 McC	O.M-E	Cot DAF	U	3 Opt	Blo 4	Own B	BF	R	8.5	63	Tim 14703H	L4IH	252	TD	Ros	5x5 1/2 x4	C	156	97 1/2	42 1/2	42 1/2 x2 1/2	52 1/2 x2 1/2			
29 Lon	D.Own	Mun	U	4 No	Spi 3	Tim 65000H	BF	R	6.9	35	Own B	L4IH	416	TD	Ros	6x3 1/2 x4	C	107	50	34	41 1/2 x2 1/2	54 1/2 x3			
30 Lon	D.Own	Mun	U	4 No	Spi 3	Tim 65000H	BF	R	8.05	40	East 433F	B4IM	524	TX	Jac	6x2 1/2 x4	C	21	74 1/2	32	42x2 1/2	56x3			
31 Per	D.Own	Cov Rus	U	4 No	Spi 3	Tim 65000H	BF	R	5.57	35	Col 5500	CW4IM	21	TD	Ros	7x3 1/2 x4	C	156	90	41 1/2	44x2 1/2	60x3			
32 Per	D.Ful	Ful MG 14	U	4 No	Spi 3	Tim 65000H	BF	R	8.5	63	Tim 15733 H	L4IH	416	TD	Ros	7x3 1/2 x4	C	107	50	34	41 1/2 x2 1/2	54 1/2 x3			
33 Own	D.Ful	Ful H	U	8 A4	Spi 3	Wls 8800	2F	R	6.33	70	Wls 30	OPX	416	TD	Ros	7x3 1/2 x4	C	138	83 1/2	36	46x3	58x3			
34 Own	D.Ful	Ful MG U	U	4 No	Spi 3	Wls 67317	2F	R	6.9	33	Shu 5515	OPX	21	TD	Ros	7x3 1/2 x4	C	138	83 1/2	36	46x3	58x3			
35 You	D.B-L	B-L 50 Max	U	7 No	Blo 4	Tim 65706	WF	R	7.25	68.8	Tim 15733 H	L4IH	490	TD	Ros	7x3 1/2 x4	C	134	82 1/2	34	42x2 1/2	56x3			
36 You	D.Ful	Ful 5012	U	4 No	Blo 4	Tim 6200H	WF	R	6.16	40	Tim 14733H	L4IH	354	TX	Ros	6x2 1/2 x4	C	126	74 1/2	34	42x2 1/2	52x3			
37 You	D.Ful	Ful GOG	U	8 A8	Blo 4	Tim 6010 H	WF	R	6.5	42	Tim 14733H	L4IH	354	TX	Ros	6x2 1/2 x4	C	126	74 1/2	34	42x2 1/2	52x3			
38 Own	D.Ful	Ful GOG	U	8 A8	Blo 4	Tim 6010 H	WF	R	7.75	68.6	Shu 5500	W21M	424	TX	Ros	6x2 1/2 x4	C	128	76 1/2	34	42x2 1/2	56x3			
39 You	D.B-L	B-L 51	U	5 No	Blo 4	Tim 6000 H	WF	R	6.75	40	Tim 15733 H	L4IH	400	TD	Ros	6x2 1/2 x4	C	120	72 1/2	34	42x2 1/2	56x3			
40 Chl	D.B-L	B-L 51	U	4 No	Blo 4	Tim 58000H	WF	R	6.8	35	Tim 15733 H	L4IH	400	TD	Ros	7x3 1/2 x4	C	110	34	40x2 1/2	56x3				
41 You	D.B-L	B-L 51	U	4 No	Blo 3	Wise 6600	2F	R	7.75	68	Tim 15733 H	L4IH	438	CD	Ros	6x3 1/2 x4	C	97	64 1/2	34 1/2	41 1/2 x2 1/2	54 1/2 x3			
42 You	D.B-L	B-L 51	U	4 No	Blo 3	Wise 6617	2F	R	6.35	37.8	Shu 5572	L4IH	438	CD	Ros	6x3 1/2 x4	C	97	64 1/2	34 1/2	41 1/2 x2 1/2	54 1/2 x3			
43 You	D.B-L	B-L 51	U	4 No	Blo 3	Wise 8800B	2F	R	7.85	46.8	Shu 5550	W21M	416	TD	Ros	6x3 1/2 x4	C	100	31	40x2 1/2	48x3				
44 You	D.B-L	B-L 51	U	4 No	Blo 3	Wise 8800B	2F	R	7.85	46.8	Shu 5550	W21M	416	TD	Ros	6x3 1/2 x4	C	100	31	40x2 1/2	48x3				
45 Lon	P.B-L	B-L 51	U	4 No	Blo 3	Wise 8800B	2F	R	7.85	46.8	Shu 5550	W21M	416	TD	Ros	6x3 1/2 x4	C	100	31	40x2 1/2	48x3				
46 G&O	P.B-L	B-L 51	U	4 No	Spi 3	Est	2F	R	7.75	48	Tim 15733 H	L4IH	416	TD	Ros	6x3 1/2 x4	C	147	84	34					

Line Number	Make, Model and Capacity	General				Tire Size		Make and Model	Engine				Fuel System	Electrical System											
		Chassis Price	Standard W.B.	Man. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front		Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement	Camshaft Drive	Piston Material	Dis. Main Bearings	Length Main Bearings	No. Main Bearings	Oiling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System	Generator, Starter Make	Line Number
<b>3 1/2 Ton—Cont'd</b>																									
1 Garford. . . . .	80	5250	175	192	16500	8200	S 36x6	S 36x12	Bud BA6	6-4 1/4 x 5 1/4	411.0	40.8	85-2400	L	G C C	2 1/2	9 1/2	4	PC	Bu	Zen	V M	A-L	1	
2 Gen. Mot. T60-6202 (X)	3035	175	154	200	18000	6925	P 34x7	DP34x7	Buick	6-3 1/2 x 5	331.4	33.7	94-2500	L	G C C	2 1/2	9 1/2	3	PC	Pe	Str	V M	D-R	2	
3 Gramm-Bernstein. . . . .	30	150	168	120	19030	6560	S 36x5	DS36x5	Con 14	4-4 1/2 x 5 1/2	349.9	32.4	70-2100	L	G C C	2 1/2	9 1/2	3	PC	Bu	Zen	V M	A-L	3	
4 Hug. . . . .	87	120	120	19030	6550	P 38x7	DP38x7	Bud DW6	6-3 1/2 x 5	330.0	33.7	70-2100	L	G C C	2 1/2	9 1/2	3	PC	Bu	Zen	V M	D-R	4		
5 Hug. . . . .	87M	120	120	21800	5700	P 36x8	DP36x8	Bud DW6	6-3 1/2 x 5	330.0	33.7	70-2100	L	G C C	2 1/2	9 1/2	3	PC	Bu	Zen	V M	D-R	5		
6 Indiana. . . . .	195	170	224	19500	7500	P 36x8	DP36x8	Con	6-4 1/4 x 5 1/4	380.9	40.8	89-2400	L	G C C	2 1/2	9 1/2	3	PC	KP	Stz	V M	A-L	6		
7 Indiana. . . . .	220	170	224	22000	8200	P 36x8	DP36x8	Con	6-4 1/4 x 5 1/4	380.9	40.8	89-2400	L	G C C	2 1/2	9 1/2	3	PC	KP	Zen	V M	A-L	7		
8 International. . . . .	HS-74	160	235	10125	9690	S 36x6	S 40x12	HaS 152	4-4 1/2 x 5 1/2	390.0	36.1	60-1800	L	G C A	3	8 1/2	3	PC	HS	Zen	G	R-B0	8		
9 International. . . . .	W-3	160	235	10125	9690	S 36x6	S 40x12	HaS 152	4-4 1/2 x 5 1/2	390.0	36.1	60-1800	L	G C A	3	8 1/2	3	PC	HS	Zen	G	R-B0	9		
10 International. . . . .	HS-74C	160	235	10290	10290	S 36x6	S 40x12	HaS 152	4-4 1/2 x 5 1/2	390.0	36.1	60-1800	L	G C A	3	8 1/2	3	PC	HS	Zen	G	R-B0	10		
11 Kenworth. . . . .	205	5850	172	223	20500	7700	P 36x8	DP36x8	Bud GL6	6-4 1/2 x 5 1/2	572.5	45.6	114-1900	L	G C C	3	10 1/2	4	PC	Bu	Zen	V M	A-L	11	
12 Kenworth. . . . .	220	5900	194	222	22000	8400	P 36x8	DP36x8	Has 160	6-4 1/2 x 5 1/2	468.2	42.3	105-2000	L	G C C	3	10 1/2	4	PC	No	Zen	V M	D-R	12	
13 La France—Republique. . . . .	1	170	191	20000	6900	P 36x8	DP36x8	Ly TS	6-3 1/2 x 5	353.0	30.8	90-2750	L	G C C	3	10 1/2	4	PC	No	Zen	V M	A-L	13		
14 La Fra.—Republique. . . . .	M-1	160	170	18400	7200	P 28.25/20	DP38x20	Wau 6X2	6-4 1/2 x 5 1/2	358.0	38.4	72-2500	L	G C C	3	13 1/2	7	PC	Wa	Zen	V M	A-L	14		
15 Larrabee. . . . .	65	4280	166	204	18400	7200	P 28.25/20	DP38x20	Her W X C	6-4 1/2 x 5 1/2	358.0	38.4	82-2400	L	G C C	3	13 1/2	7	PC	No	Zen	G	D-R	15	
16 Moreland. . . . .	E7	3520	182	200	5000	6000	P 41x6	DP41x6	Her W X C	6-4 1/2 x 5 1/2	358.0	38.4	73-3000	L	G C C	3	13 1/2	7	PC	No	Zen	G	D-R	16	
17 Omort. . . . .	35	150	150	21000	7600	P 36x8	DP36x8	Own	6-4 1/2 x 5 1/2	376.5	25.5	73-2000	L	G B	3	10 1/2	4	PC	On	Str	V M	A-L	17		
18 Pierce-Arrow. . . . .	HB	1500	156	198	7800	S 36x5	DS36x6	Bud BA6	6-4 1/2 x 5 1/2	410.0	40.8	83-2000	L	G C C	3	10 1/2	4	PC	Bu	Zen	V M	A-L	18		
19 Relay. . . . .	60DC	4745	175	192	7800	P 38x7	DP40x7	Bud BA6	6-4 1/2 x 5 1/2	411.0	40.8	83-2000	L	G C C	3	10 1/2	4	PC	Bu	Zen	V M	A-L	19		
20 Relay. . . . .	60DC	5330	175	192	8000	8000	S 40x12	DP40x12	Bud BA6	6-4 1/2 x 5 1/2	411.0	40.8	83-2000	L	G C C	3	10 1/2	4	PC	Bu	Zen	V M	A-L	20	
21 Service. . . . .	50	5250	175	192	8000	8000	S 36x6	DP36x6	Bud BA6	6-4 1/2 x 5 1/2	411.0	40.8	83-2000	L	G C C	3	10 1/2	4	PC	Bu	Zen	V M	A-L	21	
22 Ster. DW15-64.314-41 1/2	163	177	15000	5775	36x5	DP36x5	Wau 6X2	6-3 1/2 x 5	298.0	33.7	66-2400	L	G A A	3	12 1/2	7	FP	Wa	Zen	V M	A-L	22			
23 Sterling. . . . .	DW13-65	150	164	13000	5500	P 34x7	DP34x7	Wau 6X2	6-3 1/2 x 5	298.0	33.7	66-2400	L	G A A	3	12 1/2	7	FP	Wa	Zen	V M	A-L	23		
24 Stewart. . . . .	19X	3690	165	235	7010	S 36x5	DP36x5	Wau 6X2	6-3 1/2 x 5	311.0	38.4	73-3000	L	G A A	3	10 1/2	4	PS	Ha	Str	V M	D-R	24		
25 Studebaker. . . . .	99	3795	184	14000	5400	B 7.50/20	DB7.50/20	Own	8-3 1/2 x 5 1/2	337.0	39.2	115-3200	L	G C C	3	9 1/2	5	PC	No	Str	V M	D-R	25		
26 Walter. . . . .	FKD	6300	Op	118	20000	8000	P 9.00/24	DB9.00/24	Own 6	8-4 1/2 x 5 1/2	404.0	43.4	80-1800	L	G C C	3	10 1/2	4	PC	Ha	Str	V M	P	26	
27 Ward La France. . . . .	30B	197	209	16000	7800	P 8.25/20	DB8.25/20	Own 6	8-3 1/2 x 5 1/2	322.0	36.4	100-2400	L	G C C	3	10 1/2	4	FP	Ha	Str	V M	P	27		
28 Ward La France 30RU. . . . .	197	209	16000	7800	P 8.25/20	DB8.25/20	Wau 6R8	6-4 1/2 x 5 1/2	381.0	32.8	83-2200	L	G C C	3	12 1/2	7	FP	Ha	Str	V M	P	28			
29 White. . . . .	55	4650	174	215	8737	S 36x5	DS40x5	Own GRB	6-4 1/2 x 5 1/2	326.3	28.9	54-1600	L	G C C	3	11 1/2	3	FP	On	Zen	V M	P	29		
30 White. . . . .	63	5000	174	215	8350	P 34x7	DP34x7	Own 3A	6-4 1/2 x 5 1/2	396.0	38.4	72-1800	L	G C C	3	12 1/2	7	FP	Wa	Zen	V M	P	30		
31 Wichita. . . . .	6-90	4925	165	Op	20000	7500	P 34x7	DP34x7	Wau 6SRL	6-4 1/2 x 5 1/2	404.5	45.9	88-2000	L	G C C	3	13 1/2	7	FP	No	Zen	V M	P	31	
32 Witt-Will. . . . .	R3B	150	159	15500	6800	P 34x7	DP34x7	Con 18R	6-4 1/2 x 5 1/2	339.2	38.4	82-2400	L	G C C	3	13 1/2	7	FP	No	Zen	V M	P	32		
33 Witt-Will. . . . .	R35	4200	159	159	16800	6800	P 34x7	DP34x7	Con 18R	6-4 1/2 x 5 1/2	339.2	38.4	82-2400	L	G C C	3	13 1/2	7	FP	No	Zen	V M	P	33	
<b>4 Ton</b>																									
34 Armleder. . . . .	41	3000	Op	199	16300	6500	P 34x7	DP34x7	Her W XC	6-4 1/2 x 5 1/2	339.0	38.4	73-2000	L	G C C	3	12 1/2	7	PC	Ha	Zen	V M	A-L	34	
35 Atterbury. . . . .	47	4550	175	220	19315	8000	P 36x8	DP36x8	Con 20R	6-4 1/2 x 5 1/2	381.0	40.8	82-2400	L	G C C	3	12 1/2	7	PC	Ha	Zen	V M	D-R	35	
36 Available. . . . .	T-50	170	224	22000	9300	P 9.75/20	DB9.75/20	Wau 6R8	6-5 1/2 x 5 1/2	406.0	40.8	105-2000	L	G C C	3	11 1/2	4	PC	Wa	Zen	V M	A-L	36		
37 Brockway. . . . .	220	170	224	22000	8200	P 40x8	DP40x8	Con	6-4 1/2 x 5 1/2	427.5	45.9	100-2400	L	G C C	3	12 1/2	7	PC	Ha	Zen	V M	A-L	37		
38 Chicago. . . . .	1-30-4A-3	154	202	19000	6760	B 9.00/20	DB9.00/20	Wau 6R8	6-4 1/2 x 5 1/2	358.0	38.4	77-2500	L	G C C	3	12 1/2	7	PC	Ha	Zen	V M	A-L	38		
39 Clinton. . . . .	90	4800	190	190	19550	8000	S 36x5	DS36x5	Bud BA6	6-4 1/2 x 5 1/2	381.0	40.8	82-2400	L	G C C	3	12 1/2	7	PC	Ha	Zen	V M	D-R	39	
40 Clinton. . . . .	90M	4800	175	192	19550	8000	S 36x6	DS36x6	Bud BA6	6-4 1/2 x 5 1/2	411.0	40.8	83-2400	L	G C C	3	12 1/2	7	PC	Ha	Zen	V M	A-L	40	
41 Commerce. . . . .	BA-144	5800	144	144	17500	7500	P 38x9	DP38x9	Bud BA6	6-4 1/2 x 5 1/2	411.0	40.8	83-2000	L	G C C	3	12 1/2	7	PC	Bu	Zen	V M	D-R	41	
42 Moreland. . . . .	BD 7	165	165	165	16000	6000	P 34x7	DP34x7	Bud BA6	6-4 1/2 x 5 1/2	411.0	40.8	83-2000	L	G C C	3	12 1/2	7	PC						

Line Number	Radiator Make	Clutch	Gear Set		Rear Axle		Front Axle		Brakes		Frame		Body Mounting Data		Springs													
	Type and Make	Make and Model	Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and No.	Make and Model	Final Drive and Type	Drive and Torque	Reduc. in High	Reduc. in Low	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Width of Frame	Front	Rear	Auxiliary Type	Line Number				
1	Lon	P.B&B	B-L 60 Max	A	7	No	Blo	Tim 66700DP	WF	R	10.3	98.2	Tim 16302	B4IM	687	TX	Ros	9x3 1/2 x 1/2	P	144	94 1/2	34 1/2	40x3	54x3	1/2	1		
2	Lon	D. Mun	Ful G7	A	8	No	Spi	Tim 65706	WF	R	8.5	52.5	Eat 527F	B4IM	687	TX	Jac	9x3 1/2 x 1/2	P	125	69 1/2	34 1/2	40x3	54x3	1/2	2		
3	Own	D. Ful	B-L 51	A	5	No	Own	Wls	7.75	63.7	Shu	610	W2IM	614	CD	Ros	7x3 1/2 x 1/2	I	130	64 1/2	34 1/2	41 1/2 x 2 1/2	54 1/2 x 3	1/2	3			
4	You	D. B-L	B-L 51	A	5	No	Blo	3	Wls 1227	2F	H	8.64	51.5	Shu	610	W2IM	614	CD	Ros	7x3 1/2 x 1/2	I	130	64 1/2	34 1/2	41 1/2 x 2 1/2	54 1/2 x 3	1/2	4
5	You	D. B-L	B-L 55	A	7	A 7	Blo	3	Wls 1227	2F	H	8.64	82.1	Shu	610	W4IM	614	CD	Ros	8 1/2 x 3 1/2 x 1/2	T	142	84	34 1/2	40x2 1/2	54x3	1/2	5
6	G&O	D. B-L	B-L	A	4	No	Spi	3	Wls	2F	H	6.8	...	Shu	610	W4IM	614	CD	Ros	8 1/2 x 3 1/2 x 1/2	T	142	84	34 1/2	40x2 1/2	54x3	1/2	6
7	G&O	D. B-L	B-L	A	4	No	Spi	3	Wls	2F	H	6.96	...	Shu	610	W4IM	614	CD	Ros	8 1/2 x 3 1/2 x 1/2	T	142	84	34 1/2	40x2 1/2	54x3	1/2	7
8	Own	P. Own	Own	A	5	No	Own	Own	7	88.5	50.5	Eat 74F	BE4IM	850	4I	Own	8x3x 1/2	T	120	81 1/2	34 1/2	44x3	58x4	1/2	8			
9	Own	P. Own	Own	A	5	No	Own	Own	1300	CD	...	...	Own	500	BE4IM	794	I	72	81 1/2	34 1/2	44x3	58x4	1/2	9				
10	Own	P. Own	Own	A	5	No	Own	Own	5	88.5	70.5	Own 500	BE4IM	736	4I	Own	8x3x 1/2	T	120	81 1/2	34 1/2	44x3	58x4	1/2	10			
11	Per	D. B-L	B-L 60	A	8	A 3	Spi	4	Tim 65706 H	WF	H	8.6	62.0	Tim 26450 H	L4IM	508	TD	Ros	9x3x 1/2	T	132	55 1/2	33 1/2	42x2 1/2	56x3	1/2	11	
12	Per	D. B-L	B-L	A	5	A 3	Spi	6	Tim 66704DH	WF	H	8.81	79.1	Eat 74F	T4IM	649	TD	Ros	9x3x 1/2	T	111	100 1/2	33 1/2	42x2 1/2	56x3	1/2	12	
13	Own	P. B&B	Ful VUOG	A	5	No	S-P	Eat	2F	H	7.4	48.7	Eat	BE4IM	...	FD	Han	7 1/2 x 2 1/2 x 1/2	C	165	100	32 1/2	39x2 1/2	56x3	1/2	13		
14	Own	P. B&B	Ful VUOG	A	5	No	S-P	Eat	2F	H	8.95	84.2	Shu	610	T4IM	650	TD	Han	7 1/2 x 3 1/2 x 1/2	C	139	84	32 1/2	39x2 1/2	54x3	1/2	14	
15	Lon	D. B-L	B-L 51	A	4	No	Pet	Tim 65200D	WF	H	7.95	40.0	Tim 15733H	L4IM	650	TD	Opt	8x3 1/2 x 1/2	C	344	40x2	54x3	1/2	15				
16	Lon	D. B-L	B-L 51	A	4	A 4	Pet	Tim 65001H	WF	H	7.95	36.1	Tim 15733H	L4IM	650	TD	Opt	9 1/2 x 3 1/2 x 1/2	C	100	134	39 1/2	32x2 1/2	54x3	1/2	16		
17	You	D. Ful	MGM G	A	8	A 4	Blo	1567H	2F	R	9.11	74.7	Tim 15733 H	L4IM	74	TD	Ros	9x3 1/2 x 1/2	I	108	74	31	40x2 1/2	54x3	1/2	17		
18	G&O	D. Own	B-L 55	A	7	No	Own	Own	7	7.8	...	Tim	15733 H	...	...	Own	...	...	...	...	...	...	...	18				
19	Lon	Ful	Ful VU	A	5	...	Blo	Own 60	2R	...	...	...	...	...	Ros	...	...	...	...	...	...	...	19					
20	Own	P. B&B	Cov S HO	A	8	...	Blo	Own 74	2R	...	...	...	...	...	Ros	...	...	...	...	...	...	...	20					
21	Lon	D. B-L	B-L 60 Max	A	7	...	Blo	Tim 65700DP	WF	H	10.3	98.2	Tim 16302	L4IM	387	TX	Ros	7x2x 1/2	C	149	85 1/2	34 1/2	48x3	54x3	1/2	21		
22	Hex	D. B-L	B-L 51	A	4	Op	Spi	Tim 65000 H	WF	H	8.5	45.5	Tim 15733 H	L4IM	387	TX	Ros	7x2x 1/2	C	124	72 1/2	33 1/2	48x3	54x3	1/2	22		
23	Hex	D. B-L	B-L 51	A	5	No	Spi	Wls 8317L	WF	H	8.25	49.2	Shu 5429	L4IM	398	TX	Ros	7x2x 1/2	C	162	100	32 1/2	39x2 1/2	54x3	1/2	23		
24	Mod	D. Ful	Ful	A	12	A	Spi	3	Tim	65000 H	WF	H	7.25	127	Sal	B4IM	...	TD	Ros	9x2x 1/2	C	136	84	32 1/2	40x2 1/2	56x3	1/2	24
25	Lon	D. Lon	Ful	A	4	No	Spi	1	Tim	65001H	WF	H	5.11	126	Eat	B4IM	505	TD	Ros	8 1/2 x 3 1/2 x 1/2	C	143	91 1/2	38x2 1/2	56 1/2 x 3	1/2	25	
26	Own	P. Own	Own	A	5	No	Own	Own	2D	...	...	...	...	...	O4XFM	600	TD	8 1/2 x 3 1/2 x 1/2	C	78	36	52x4	52x4	1/2	26			
27	Own	P. B-L	B-L 51	A	4	Op	Cle	Wls	2F	R	7	46	Tim 15733H	L4IM	...	TX	Ros	7x3 1/2 x 1/2	C	144	100	34 1/2	40x2 1/2	60x3	1/2	27		
28	Own	P. B-L	B-L 51	A	4	Op	Cle	Wls	2F	R	7	46	Tim 15733H	L4IM	...	TX	Ros	7x3 1/2 x 1/2	C	144	100	34 1/2	40x2 1/2	60x3	1/2	28		
29	Own	P. Own	Own 4B	A	4	No	Spi	3	Own 55	2F	R	10.1	98.2	Own 55	OPXFM	224	2I	Own	8x3 1/2 x 1/2	C	166	105	42 1/2	44x3	51 1/2 x 5	1/2	29	
30	Own	P. Own	Own 4B	A	4	No	Spi	4	Own 10C	2F	R	6.33	41.4	Own 6D	L4IM	554	FI	Own	8x3 1/2 x 1/2	C	144	84 1/2	34	42x3	56x3	1/2	30	
31	You	D. B-L	B-L 60	A	7	No	S-T	Own 50R	WF	R	6.05	73.6	Shu 610	B2IM	342	RI	Ros	7x2 1/2 x 1/2	C	120	76	32	41x2 1/2	54x3	1/2	31		
32	Per	D. B-L	B-L 51	A	4	No	Spi	Tim 65001H	WF	R	6.83	36.5	Tim 15733H	L4IM	650	CD	Ros	7x2 1/2 x 1/2	C	134	76	32	41x2 1/2	54x3	1/2	32		
33	Per	D. B-L	B-L 51	A	4	No	Spi	Tim 65706H	WF	H	7.00	38.8	Tim 15733H	L4IM	768	CD	Ros	7x2 1/2 x 1/2	C	76	32	41x2 1/2	54x3	1/2	33			
34	Own	D. Ful	Ful MG U	U	4	No	Spi	Tim 58000	2F	H	7.25	38.8	Shu 5572	L4IM	...	TD	Ros	7x3x 1/2	C	169	103 1/2	34	40x2 1/2	62 1/2 x 3	1/2	34		
35	You	D. B-L	B-L 60	A	7	No	Spi	Tim 65706D	WF	H	9.1	90.0	Shu 610	T2IMV	500	TD	Ros	8x3 1/2 x 1/2	P	103	36	42 1/2	52x3	1/2	35			
36	You	D. B-L	B-L 60	A	7	No	Blo	Tim 66700	WF	H	9.1	90.0	Shu 610	T2IMV	500	TD	Ros	8x2 1/2 x 1/2	P	Opt	36	42 1/2	52x3	1/2	36			
37	G&O	D. B-L	B-L 60	A	7	No	Blo	Tim 65706	WF	H	6.96	...	Shu 610	T2IMV	500	TD	Ros	8 1/2 x 3 1/2 x 1/2	T	142	34 1/2	40x2 1/2	54x3	1/2	37			
38	Chi	D. B-L	B-L 51	A	5	No	Blo	Tim 65706H	WF	H	6.0	35.8	Tim 15733H	L4IM	631	TD	Ros	7x3x 1/2	T	133	41 1/2	34 1/2	54 1/2 x 3	1/2	38			
39	Own	D. B-L	B-L 55 Max	A	7	No	Blo	66600	WF	H	8.75	46.8	Tim 16302	T2IMV	235	2I	Ros	8x3 1/2 x 1/2	T	Opt	38	43 1/2	53 1/2 x 3	1/2	39			
40	Own	D. B-L	B-L 55 Max	A	7	No	Blo	66600	WF	H	8.75	83.1	Tim 16302	T2IMV	235	2I	Ros	8x3 1/2 x 1/2	T	Opt	38	43 1/2	53 1/2 x 3	1/2	40			
41	Lon	D. Own	B-L 60 Max	A	7	...	Blo	Tim 66700DP	WF	H	10.3	98.2	Tim 16302	L4IM	162	TD	Ros	7x3x 1/2	T	144	94 1/2	34 1/2	44x3	54x3	1/2	41		
42	Per	D. B-L	B-L 55	A	7	No	Spi	Tim 65706	WF	H	8.81	53.0	Shu	5572	L4IM	787	TD	Ros	7x3x 1/2	T	120	94 1/2	34 1/2	44x3	54x3	1/2	42	
43	Per	D. B-L	B-L 55	A	7	No	Spi	Tim 65706D	WF	H	7.4	45.5	Tim 15733H	L4IM	489	TD	Ros	7x4x 1/2	C	134	77 1/2	34 1/2	44x3	54x3	1/2	43		
44	Per	D. B-L	B-L 55 & 60	U	7	A 3	Spi	Tim 66706	WF	H	6.92	124	Tim 16000	T2IMV	...	TD	Ros	7x3x 1/2	C	168	101	34 1/2	44x3	60x3	1/2	44		
45	Per	D. B-L</td																										



Line Number	Radiator Make	Clutch	Gear Set			Rear Axle			Front Axle		Brakes		Frame		Body Mounting Data		Springs		Auxiliary Type							
			Type and Make	Make and Model	Location	No. of Forward Speeds		Aut. Locat. and Speeds	Universal Make and No.			Final Drive and Type	Drive and Torque	Gear Ratios		Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Width of Frame	Front	Rear	
						No. 1	No. 2		No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14						
1	Per	D.Ful	Ful H U 16	U 4 No	Blo	WF 12527KW	2F	H 4.00	25.2	Tim 1660	4IA	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	C	198 1/2	141 1/2	41 1/2	44x3	60x4	1					
2	Own	D.Ful	Ful H 16	U 4 No	Blo	WF 1700	2F	H 7.33	82.0	Tim 30	OPM	TD	Ros	7 1/2 x 3 1/4	C	138	83 1/2	36	46x3	58x3 1/2	2					
3	Own	D.Ful	Ful H 1	U 4 No	W	WF 1700	2F	H 7.33	82.0	Tim 30	OPM	TD	Ros	7 1/2 x 3 1/4	C	138	83 1/2	36	46x3	58x3 1/2	3					
4	Own	D.Ful	Ful H 1	U 4 No	W	WF 1700	2F	H 7.33	82.0	Tim 30	OPM	TD	Ros	7 1/2 x 3 1/4	C	138	83 1/2	36	46x3	58x3 1/2	4					
5	You	D.B-L	B-L 60	A 7 No	Blo	Tim66704DH	WF	H 9.00	85.5	Tim 16710H	L74IHV	690	TD	Ros	7 1/2 x 3 1/4	C	144	87 1/2	34	42x2 1/2	62x3 1/2	5				
6	Chi	D.B-L	B-L 55	A 7 No	Blo	Wf 1500	2F	R 1.0	90.5	Tim 16710H	4IHV	TD	Ros	7 1/2 x 3 1/4	C	110	82 1/2	34	40x2 1/2	56x3 1/2	6					
7	Chi	D.B-L	B-L 55	A 7 No	Blo	Wf 1500	2F	R 1.0	90.5	Tim 16710H	4IHV	TD	Ros	7 1/2 x 3 1/4	C	168	92	34	40x2 1/2	56x3 1/2	7					
8	You	D.B-L	B-L 55	A 7 No	Blo	Wf 12527	2F	R 8.6	82.0	Shu 678	W4IA	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	162	99	36	40x3	54x4	8					
9	Lon	D.B-L	B-L 55	A 7 No	Spi	Sp 3	Tim	WF 8.75	82.0	Shu 678	BO4IM	736	41	Own	8 1/4 x 3 1/4	T	120	82 1/2	34	44x2 1/2	52x3	9				
10	Own	P.Own	B-L 55	A 7 No	Spi	Sp 6	Tim	WF 8.50	90.5	Tim 16302	W2IM	802	FD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	154 1/2	99 1/2	37	49x3	56x4	10				
11	Own	D.B-L	B-L 55	A 7 No	Spi	Sp 6	Tim	WF 10.0	96.0	Tim 16300	W2IM	802	FD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	148	92 1/2	34	44x2 1/2	52x3	11				
12	Mod	D.B-L	B-L 60 Max	A 7 No	Spi	Sp 6	Tim	WF 9.66	51.7	Tim 16302	W2IM	802	FD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	154 1/2	99 1/2	37	49x3	56x4	12				
13	Bus	D.B-L	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 9.7	8.8	Tim 16702TW	T4IA	TD	Ros	12 1/2 x 3 1/4 x 4 1/4	P	180	101 1/2	34	42x3	58 1/2 x 3	13					
14	Per	B-L	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 10.2	54.8	Tim 17300	T4IA	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	180	101 1/2	34	42x3	58 1/2 x 3	14					
15	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 7.17	46.1	Own BC	O4IV	589	FD	Own	8 1/4 x 3 1/4	T	120	70 1/2	33 1/2	42 1/2 x 3	54x3	15				
16	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 4.25	46.1	Own BJ	O4IV	578	FD	Own	8 1/4 x 3 1/4 x 4 1/4	T	144	80	33 1/2	33 1/2 x 3	56 1/2 x 3 1/2	16				
17	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 5.99	35.5	Own AK	O4IV	490	JX	Own	8 1/4 x 3 1/4 x 4 1/4	C	132	93 1/2	37 1/2	48x3	52x4	17				
18	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 6.46	41.5	Own AC	O4IV	490	JX	Own	8 1/4 x 3 1/4 x 4 1/4	C	132	92	37 1/2	46x3	52x4	18				
19	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 7.75	85.0	Tim 16710H	L4IHV	429	TI	Own	9 1/2 x 3 1/4 x 4 1/4	C	156	99	34	39 1/2 x 3	54x3	19				
20	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 7.8	8.8	Tim 16702TW	T4IA	TD	Ros	12 1/2 x 3 1/4 x 4 1/4	P	180	101 1/2	34	42x3	58 1/2 x 3	20					
21	Own	P.Own	B-L 60	A 7 No	Spi	Sp 6	Tim	WF 10.1	54.8	Tim 17300	T4IA	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	180	101 1/2	34	42x3	58 1/2 x 3	21					
22	Own	D.Own	B-L 60 RD	A 7 No	Spi	Sp 6	Tim	WF 8.88	52.0	Tim 1660W	W2IM	802	FD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	154 1/2	99 1/2	37	49x3	56x4	22				
23	Own	D.Ful	Ful VU	A 5 No	Spi	Sp 6	Tim	WF 8.00	52.0	Tim 1660W	L4IHV	690	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	216	148	34	44x2 1/2	52x3	23				
24	You	D.Ful	Ful MG U	A 4 Op	Spi	Sp 6	Tim	WF 8.00	52.0	Shu 5572	L4IHV	690	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	Opt	31 1/2	40x2 1/2	50x3	24					
25	Own	D.B-L	B-L 55	A 7 No	Blo	Wf 1500	2F	R 10.8	8.0	Tim 16700DP	WF	10 1/2	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	144	94 1/2	34	42x3	56x4	25				
26	Lon	D.Own	B-L 60 Max	A 7 No	Spi	Sp 6	Tim	WF 10.15	51.5	Tim 16302	TD	209	TD	Ros	9 1/2 x 3 1/4 x 4 1/4	C	136 1/2	79 1/2	32	40x3	56x4	26				
27	Mod	D.Ful	Ful	A 8 U	Spi	Sp 3	Tim	WF 8.50	85.0	Tim 16302	B4IMV	600	TD	Ros	13x3 1/2	T	139	36	45x3	56x4	27					
28	Own	Own	B-L 60	A 5 No	Own	Own	WF	8.50	85.0	Own	O4IM	600	TD	Own	13x3 1/2	T	126	96	36	52x4	52x4	28				
29	Own	P.B-L	B-L	A 7 No	Spi	Tim	WF	Opt	Opt	Tim	T21MV	TD	Ros	8x3 1/2 x 3 1/2	Opt	Opt	37	44x3	56x3 1/2	29						
30	Own	P.B-L	B-L	A 7 No	Spi	Tim	WF	Opt	Opt	Tim	T21MV	TD	Ros	8x3 1/2 x 3 1/2	Opt	Opt	37	44x3	56x3 1/2	30						
31	Own	P.Own	OwnGRBA	U 5 AI	Spi	Sp 3	Tim	WF 11.7	58.4	Own 52	OPXM	224	TI	Own	8x	I	166	105 1/2	42 1/2	44x3	51 1/2 x 5	31				
32	Own	P.Own	Own 4B	U 4 Op	Spi	Sp 4	Tim	WF 10.16	66.5	Own 9D	O21A	349	TI	Own	8x	I	166 1/2	105 1/2	42 1/2	44x3	51 1/2 x 5	32				
33	dp.Own	Own 7B	U 4 No	Spi	Sp 2 C	Tim	WF 7.16	46.9	Tim 16700	LA1HV	690	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	C	156 1/2	91 1/2	34 1/2	42x3	56x3 1/2	33					
34	Per	D.B-L	B-L 55	A 4 A7	Spi	Tim66704DH	WF	R 9.0	98.2	Tim 16700H	LA1HV	690	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	C	76	36	Var	34	34	34	34	34	34	34
35	Own	D.Own	Own 5R	A 4 No	Own	Own 5R	WF	H 10.0	54.4	Own 5R	O2M	TD	Ros	8 1/4 x 3 1/4	P	Opt	Opt	36	45x3	56x4	35					
36	Bus	D.Own	Own 5R	A 4 No	Own	Own 5R	WF	H 11.7	63.5	Own 5R	O2M	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	209	139	36	45x3	56x4	36					
37	G&O	P.B-L	B-L 70	A 7 No	Spi	Sp 4	Tim	WF 6.13	83.0	Own 16R	L74DV	674	TD	Ros	10 1/2 x 3 1/4 x 4 1/4	P	159 1/2	88 1/2	34 1/2	42 1/2 x 3	54 1/2 x 4	37				
38	Own	D.B-L	B-L 70	A 7 No	Spi	Sp 4	Tim	WF 10.0	94.0	Tim 27450	TD	864	TD	Ros	8x3 1/2 x 3 1/2	C	162	99	36	40x3	54x4	38				
39	Own	D.B-L	B-L 60 Max	A 7 No	Spi	Sp 4	Tim	WF 7.25	68.8	Tim 16302	T4IA	495	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	157 1/2	97 1/2	34	45x3	56x4	39				
40	Chi	D.B-L	B-L 60 Max	A 7 No	Spi	Sp 4	Tim	WF 7.25	68.8	Tim 16302	T4IA	495	TD	Ros	8 1/4 x 3 1/4 x 4 1/4	P	162	97 1/2	34	45x3	56x4	40				
41	Own	D.B-L	B-L 60	A 7 No	Spi	Sp 4	Tim	WF 11.7	63.5	Tim 16302	T21MV	603	TI	Ros	8 1/4 x 3 1/4 x 4 1/4	P	162	109	34	46x3	56x4	41				
42	Per	B-L	B-L 74	A 8 A	Spi	Sp 2	Tim	WF 11.7	111	Own	T21MV	603	TI	Ros	8 1/4 x 3 1/4 x 4 1/4	P	162	109	34	46x3	56x4	42				
43	Lon	D.Own	B-L 60 Max	A 7 No	Spi	Sp 4	Tim	WF 10.1	95.0	Tim 16300	T21MV	603	TI	Ros	8 1/4 x 3 1/4 x 4 1/4	P	162	109	34	46x3	56x4	43				
44	Per	D.B-L	B-L 60 Max	A 7 No	Spi	Sp 4	Tim	WF 10.1	95.0	Tim 16300	T21MV	603	TI	Ros	8 1/4 x 3 1/4 x 4 1/4	P	162	109	34	46x3	56x4	44				
45	Lon	D.B-L	B-L 60	A 7 No	Spi	Sp 4	Tim	WF 10.1	95.0	Tim 16																

Line Number	Make, Model and Capacity	General			Tire Size		Make and Model	Engine			Fuel System	Electrical System	Line Number										
		Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)		Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement	Camshaft Drive	Piston Material	Di. Main Bearings	Length Main Bearings	No. Main Bearings	Oiling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make
<b>Gasoline Tractor-Trucks—Cont'd</b>																							
1	Federal	4C6A/4735	144/161	50000	8120	P 36x8	DP36x8	Con 20R	6-4 1/2 x 4 3/4	381	40.8	90-2200	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Co	Zen	M	D-R	D-R
2	Federal	4C6AB/4960	144/161	50000	8505	S 36x8	DP36x8	Con 20R	6-4 1/2 x 4 3/4	381	40.8	90-2200	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Pe	Zen	M	D-R	D-R
3	Federal	... X8B 5085	155	65000	9650	S 36x8	S 40x14	Con B7	6-4 1/2 x 4 3/4	426	40.0	61-1350	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10 1/2	3	FP	Co	Zen	M	D-R	D-R
4	Federal	X8R 5810	155	65000	9900	P 40x8	DP40x8	Con 21R	6-4 1/2 x 5 1/2	411	45.9	100-2200	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Bu	Str	E	R-Bo	R-Bo
5	Freeman	BAT-144 77	67	6450	144	P 38x9	DP38x9	Bud BA6	6-4 1/2 x 5 1/2	411	40.8	83-2100	L EHH	C C C C C C C C	2 1/2 x 2 1/2	9 1/2	4	PC	Co	Zen	M	R-Bo	R-Bo
6	Freeman	GLT-144 7 1/2	7050	144	10500	P 38x9	DP38x9	Bud GL6	6-4 1/2 x 6	572	45.6	114-1900	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10 1/2	3	PC	Bu	Str	E	R-Bo	R-Bo
7	Gen. Mot.	2216 2 1/2-3	1035	130	14000	P 30x5	DP30x5	Pontiac	6-3 1/2 x 3 1/2	200	32.8	58-3000	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	3	PC	Ha	Mar	M	D-R	D-R
8	Gen. Mot.	2512 2 1/2-3	1380	130	14000	P 32x6	DP32x6	Buick	6-3 1/2 x 3 1/2	257	52.3	76-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
9	Gen. Mot.	3204 3-4-T	1700	141	17000	P 32x6	DP32x6	Buick	6-3 1/2 x 3 1/2	257	52.3	76-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
10	Gen. Mot.	4201 4-8-T	1845	141	19000	P 32x6	DP32x6	Buick	6-3 1/2 x 3 1/2	257	52.3	76-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
11	Gen. Mot.	4404 5-6 1/2	2095	141	23000	P 34x7	DP34x7	Buick	6-3 1/2 x 3 1/2	257	52.3	76-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
12	Gen. Mot.	6202 6 1/2-7 1/2	3035	154	25000	P 34x7	DP34x7	Buick	6-3 1/2 x 3 1/2	331	43.3	74-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
13	Gen. Mot.	8209 6 1/2-10	3935	155	35000	P 38x9	DP38x9	Buick	6-3 1/2 x 3 1/2	331	43.3	74-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
14	Gen. Mot.	8207 10-12-T	4070	155	40000	P 38x9	DP38x9	Buick	6-3 1/2 x 3 1/2	331	43.3	74-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	4	PC	Ha	Mar	M	D-R	D-R
15	Gramm	B118 3 Ton	118	174	3875	P 30x5	DP30x5	Lye 4SL	6-3 1/2 x 4 1/2	224	0.25	56-2700	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	No	No	V	A-L	A-L
16	Gramm	C122 5 Ton	122	196	4820	P 32x6	DP32x6	Lye ASA	6-3 1/2 x 4 1/2	278	61.5	85-2700	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L
17	Gramm	D122 5 Ton	122	196	5020	P 32x6	DP32x6	Lye TS	6-3 1/2 x 4 1/2	333	8.6	32-2000	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L
18	Gramm	E118 6 Ton	118	196	5200	P 34x7	DP34x7	Lye TS	6-3 1/2 x 4 1/2	333	8.6	32-2000	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L
19	Gramm	GW 5175	153	200	44000	B 9.00/20	DP9.00/20	Con 21R	6-4 1/2 x 4 3/4	427	45.9	100-2200	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Co	Zen	M	A-L	A-L
20	Gramm	45-10 Ton	153	200	7600	S 36x5	DP36x5	Con 21R	6-4 1/2 x 4 3/4	365	82.4	59-	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	3	PC	Pe	Zen	M	A-L	A-L
21	Gramm	45-10 Ton	153	200	7600	S 36x5	DP36x5	Lye TS	6-3 1/2 x 4 1/2	333	8.6	32-2000	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L
22	Gramm	45-10 Ton	153	200	7600	S 36x5	DP36x5	Lye TS	6-3 1/2 x 4 1/2	333	8.6	32-2000	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Pe	Zen	M	A-L	A-L
23	Gramm	60 15 Ton	153	200	8700	S 36x6	DP36x6	Lye TS	6-3 1/2 x 4 1/2	333	6.6	31-	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L
24	Gramm	60 15 Ton	153	200	8700	S 36x6	DP36x6	Bud DW6	6-3 1/2 x 4 1/2	331	43.3	74-2500	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L
25	Hug	486	140	3650	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
26	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
27	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
28	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
29	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
30	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
31	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
32	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
33	Indiana	140	3650	5500	P 32x6	DP32x6	Con	6-4 1/2 x 4 1/2	311	38.4	73-2400	L EHH	C C C C C C C C	2 1/2 x 2 1/2	10	3	PC	Ha	Mar	M	A-L	A-L	
34	International	AW-2	136	136	4300	P 32x6	DP32x6	Wau XA	6-3 1/2 x 4 1/2	224	19.6	30-2700	L EHH	C C C C C C C C	2 1/2 x 2 1/2	6 1/2	3	PC	No	Zen	V	D-R	D-R
35	International	A-1 3	136	136	4300	P 32x6	DP32x6	Wau XA	6-3 1/2 x 4 1/2	224	25.3	61-2300	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Ha	Mar	M	D-R	D-R
36	International	A-4	145	145	5070	P 32x6	DP32x6	Own FBB	6-3 1/2 x 4 1/2	224	25.3	65-2300	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Ha	Mar	M	D-R	D-R
37	International	A-5	140	5573	P 34x7	DP34x7	Own FBB	6-3 1/2 x 4 1/2	224	25.3	65-2300	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Ha	Mar	M	D-R	D-R	
38	International	A-6	156	210	5756	P 34x7	DP34x7	Own FBB	6-3 1/2 x 4 1/2	224	25.3	65-2300	L EHH	C C C C C C C C	2 1/2 x 2 1/2	13 1/2	7	PC	Ha	Mar	M	D-R	D-R
39	International	HS-54	130	7673	S 36x5	DP36x5	HaS 151	6-4 1/2 x 5 1/2	312	28.9	54-1800	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	3	PC	Ha	Mar	M	R-Bo	R-Bo	
40	International	HS-54C	130	7900	S 36x5	DP36x5	HaS 151	6-4 1/2 x 5 1/2	312	28.9	54-1800	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	3	PC	Ha	Mar	M	R-Bo	R-Bo	
41	International	W-1	130	8100	S 36x5	DP36x5	HaS 151	6-4 1/2 x 5 1/2	312	28.9	54-1800	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	3	PC	Ha	Mar	M	R-Bo	R-Bo	
42	International	HS-74	144	9530	S 36x5	DP36x5	HaS 152	6-4 1/2 x 5 1/2	312	28.9	54-1800	L EHH	C C C C C C C C	2 1/2 x 2 1/2	8 1/2	3	PC	Ha	Mar	M	R-Bo	R-Bo	
43	International	HS-74C	144	9955	S 36x5	DP36x5	HaS 152	6-4 1/2 x 5 1/2	312	28.9	54-1800	L EHH	C C C C C C C C	2 1/2 x 2 1/2									

Line Number	Radiator Make	Clutch	Gear Set		Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and No.	Make and Model	Rear Axle			Front Axle	Brakes		Frame	Body Mounting Data		Springs		Line Number			
			Type and Make	Make and Model						Wheels Driven	Final Drive and Type	Drive and Torque		Reduc. in High	Reduc. in Low		Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame
1	Lon	P.B&B	B-L 55	A 7 No	P-S	Tim 66704-hp		WF	R 8.67	82.3	Own	L4IHV	894	RI		Ros	7 1/2 x 3 1/2 x 1/2	C	92	60	34	42x2 1/2	54x3	1
2	Lon	P.B&B	B-L 55	A 7 No	P-S	Tim 66704-WP		WF	R 8.67	82.3	Own	T4IA	921	RI		Ros	7 1/2 x 3 1/2 x 1/2	C	92	60	34	42x2 1/2	54x3	2
3	Lon	P.B&B	B-L 55	A 7 No	P-S	Tim 68700-DR		WF	R 11.0	111	Own	T2IMV	603	RI		Gen	9 1/2 x 3 1/2 x 1/2	C	120	51	38	44x3	56x3 1/2	3
4	Lon	P.B&B	B-L 60	A 7 No	P-S	Tim 68703-DR		WF	R 11.0	111	Own	T2IMV	662	RI		Gen	9 1/2 x 3 1/2 x 1/2	C	120	51	38	44x3	56x3 1/2	4
5	Lon	D.Ful	Ful HU16	A 4 No	BC	Own		I	R 8.53	155	Own	O4FXM	336	TX		Woh	7 1/2 x 3 1/2	C	100	72 1/2	32	52x4	52x4	5
6	Lon	D.Ful	Ful HU16	A 4 No	BC	Own		I	R 8.53	155	Own	O4FXM	336	TX		Woh	8x3 1/2 x 1/2	C	95	66 1/2	32	54x3	52x4	6
7	Lon	P.Own	Mun	A 4 No	Spl	Tim 5261		S 1/2	H 8.6	37.8	Tim 11710	B4IM	377	TX		Jac	6x2 1/2 x 1/2	C	87	48	34	28x2	50 1/2 x 2 1/2	7
8	Lon	D.Own	Mun	A 4 No	Spl	Tim 5261		S 1/2	H 8.6	34.5	Tim 11710	B4IM	377	TX		Jac	6x2 1/2 x 1/2	C	87	48	34	28x2	50 1/2 x 2 1/2	8
9	Lon	D.Own	Mun	A 4 No	Spl	Eat 1617		S 1/2	H 6.42	32.7	Eat 433F	B4IM	453	TX		Jac	6 1/2 x 3 x 1/2	C	107	59	34	38x2 1/2	50x3	9
10	Lon	D.Own	Mun	A 4 No	Spl	Eat 1717		S 1/2	H 7.14	36.2	Eat 433F	B4IM	524	TX		Jac	6 1/2 x 3 x 1/2	C	107	59	34	38x2 1/2	50x3	10
11	Lon	D.Own	Mun	A 4 No	Spl	Eat T44 DR		WF	R 9.45	48.0	Eat 433F	B4IM	524	TX		Jac	6 1/2 x 3 x 1/2	C	107	59	34	38x2 1/2	50x3	11
12	Lon	D.Own	Mun	A 4 No	Spl	Tim 65706		WF	R 10.7	65.9	Eat 527 F	B4IM	687	TX		Jac	9x3 1/2 x 1/2	C	125	69 1/2	32	54x3	54x3	12
13	Lon	D.Own	Mun	A 4 No	Spl	Tim 65706		WF	R 10.7	65.9	Eat 527 F	B4IM	687	TX		Jac	9x3 1/2 x 1/2	C	125	69 1/2	32	54x3	54x3	13
14	Lon	D.Own	B-L	A 5 No	Pet	Tim 66704		WF	R 12.3	101	Eat 527 F	B4IM	795	TX		Jac	9x3 1/2 x 1/2	C	125	70	34	40x3	54x3	14
15	Lon	D.Own	B-L	A 5 No	Pet	Tim 66704		WF	R 12.3	101	Eat 527 F	B4IM	795	TX		Jac	9x3 1/2 x 1/2	C	125	70	34	40x3	54x3	15
16	Per	P.Own	Cov A-J	A 4 No	Blo	Tim 54000		BF	H	...	Col 4003	L4IH	...	TX		Ros	6x2 1/2 x 1/2	C	38 1/2	34	40x2 1/2	54x2 1/2	16	
17	Per	D.Own	Cov W4J	A 4 No	Blo	Tim 56000		BF	H	...	Col 4003	L4IH	...	TX		Ros	6x2 1/2 x 1/2	C	39 1/2	34	42x2 1/2	56x3	17	
18	Per	D.Own	Cov W4J	A 4 No	Blo	Tim 56000H		BF	H	...	Col 5500	L4IH	...	TX		Ros	6x2 1/2 x 1/2	C	42 1/2	34	40x2 1/2	52x3	18	
19	Per	D.Own	Cov W4J	A 4 No	Blo	Wls 6617B		BF	H	...	Col 5500	L4IH	...	TX		Ros	6x2 1/2 x 1/2	C	42 1/2	34	40x2 1/2	52x3	19	
20	Per	Ful	Ful MGU	U A	No	Wls12525-KW	2	2F	H 6.3	41.0	Tim 41A	864	CD			7 1/2 x 3x3 1/2	C	128 1/2	73 1/2	36	46x3	58x3 1/2	20	
21	Own	D.Ful	Ful H	A 8 No	Pet	Wls 1450		2F	H 7.08	79.0	Tim 30	...	...			Ros	7 1/2 x 3x3 1/2	C	138	83	34	42x2 1/2	54x3	21
22	Own	D.Ful	Ful H	A 8 No	Pet	Wls 1450		2F	H 7.08	79.0	Tim 30	...	...			Ros	7 1/2 x 3x3 1/2	C	138	83	34	42x2 1/2	54x3	22
23	Own	D.Ful	Ful H	A 8 No	Pet	Wls 1700		2F	H 7.33	133	Tim 30	...	...			Ros	7 1/2 x 3x3 1/2	C	138	83	34	42x2 1/2	54x3	23
24	Own	D.Ful	Ful H	A 8 No	Pet	Wls 1700		2F	H 7.33	133	Tim 30	...	...			Ros	7 1/2 x 3x3 1/2	C	138	83	34	42x2 1/2	54x3	24
25	You	B-L	B-L 51	U	No	Wls 8800B		WF	H 7.85	46.5	Tim 5550	W21M	21	RI		Ros	7 1/2 x 3x3 1/2	C	81	61	34	41x2 1/2	48x3	25
26	Lon	P.B&B	...	U 4 No	Spl	Col		SF	H 5.12	20.9	Tim 5550	C4IM	41	TX		Ros	5 1/2 x 2x3 1/2	C	95	53	32	40x2 1/2	46x2 1/2	26
27	G&O	D-B-L	...	U 4 No	Spl	Wls		2F	H 6.16	35.3	Col	L4IH	...	CD		Ros	7 1/2 x 3x3 1/2	C	90	51	34	40x2 1/2	54x3	27
28	G&O	D-B-L	...	U 4 No	Spl	Wls		2F	H 6.41	...	Shu	L4IH	...	CD		Ros	8x3x4	C	90	51	34	40x2 1/2	54x3	28
29	G&O	D-B-L	...	U 4 No	Spl	Wls		2F	H 6.96	...	Shu	L4IH	...	CD		Ros	8 1/2 x 3x3 1/2	C	90	51	34	40x2 1/2	54x3	29
30	G&O	D-B-L	...	U 4 No	Spl	Tim		WF	H 7.75	78.6	Shu	T21MV	...	CD		Ros	7x3x3 1/2	C	103	63	36	40x3	54x4	30
31	Lon	P.B&B	...	U 4 No	Spl	Tim		WF	H 7.75	78.6	Shu	L4IH	...	CD		Ros	8x3x4	C	103	63	36	40x3	54x4	31
32	Lon	D-B-L	B-L 51	U	No	Tim		WF	H 10.0	98.0	Shu	T4IA	864	TD		Ros	8x3x4	C	103	63	36	40x3	54x4	32
33	Lon	D-B-L	B-L 51	A 7 No	Spl	Tim		S 1/2	H 5.29	72.4	Own 100	BE4IM	292	RI		Ros	5 1/2 x 2x3 1/2	C	93 1/2	53	32	40x2 1/2	46x2 1/2	33
34	Lon	Rot	...	U 4 No	Spl	Wls 700		S 1/2	H 6.50	42.9	Own 200	BE4IM	295	RI		Ros	5 1/2 x 2x3 1/2	C	98 1/2	55	32	40x2 1/2	52x2 1/2	34
35	Mod	P.Own	W-G T7	U 4 No	Spl	Wls 800		S 1/2	H 6.5	47.8	Own 250	BE4IM	378	RI		Ros	7 1/2 x 3x3 1/2	C	104	61 1/2	34	42x3	54x3	35
36	Own	P.Own	W-A-5	U 4 No	Spl	Wls 800		S 1/2	H 7.16	52.6	Own 300	BE4IM	430	RI		Ros	7 1/2 x 3x3 1/2	C	99	56 1/2	34	42x3	56x3	36
37	Mod	P.Own	W-A-5	U 4 No	Spl	Wls 1150		S 1/2	H 7.16	52.6	Own 300	BE4IM	426	RI		Ros	7 1/2 x 3x3 1/2	C	115	72 1/2	34	42x3	56x3	37
38	Own	P.Own	W-A-5	U 4 No	Spl	Wls 1150		S 1/2	H 7.16	52.6	Own 300	BE4IM	426	RI		Ros	7 1/2 x 3x3 1/2	C	115	72 1/2	34	42x3	56x3	38
39	Own	P.Own	W-A-5	U 4 No	Spl	Wls 1150		S 1/2	H 7.16	52.6	Own 300	BE4IM	426	RI		Ros	7 1/2 x 3x3 1/2	C	115	72 1/2	34	42x3	56x3	39
40	Own	P.Own	W-A-5	U 4 No	Spl	Wls 1200		S 1/2	H 6.55	60.5	Own 400	BE4IM	510	RI		Ros	7 1/2 x 3x3 1/2	C	115	72 1/2	34	42x3	56x3	40
41	Own	P.Own	W-A-5	U 4 No	Spl	Eat 74		CD	H 7.85	70.5	Eat 74	BE4IM	850	RI		Ros	7 1/2 x 3x3 1/2	C	101	65 1/2	34	44x3	58x3	41
42	Own	P.Own	W-A-5	U 4 No	Spl	Eat 74		CD	H 8.81	79.1	Eat 74	BE4IM	836	RI		Ros	7 1/2 x 3x3 1/2	C	95 1/2	67 1/2	34	44x3	58x3	42
43	Own	P.Own	W-A-5	U 4 No	Spl	Eat 1300		CD	H 7.85	70.5	Eat 74	BE4IM	836	RI		Ros	7 1/2 x 3x3 1/2	C	101	65 1/2	34	44x3	58x3	43
44	Own	P.Own	W-A-5	U 4 No	Spl	Eat 1300		CD	H 7.85	70.5	Eat 74	BE4IM	836	RI		Ros	7 1/2 x 3x3 1/2	C	101	65 1/2	34	44x3	58x3	44
45	Own	P.Own	W-A-5	U 4 No	Spl	Eat 1300		CD	H 10.1	90.5	Eat 74	BE4IM	836	RI		Ros	7 1/2 x 3x3 1/2	C	101	65 1/2	34	44x3	58x3	45
46	Own	P.Own	BL	U 4 No	Spl	Tim 5200		SF	H 4.86	24.0	Own 200	L4IH	302	TX		Ros	8x3x4	C	84 1/2	54 1/2	34	40 1/2 x 2 1/2</td		

## KEY OF REFERENCES

### GENERAL

**Gross Vehicle Weight**—Chassis weight, plus body and cab, plus pay load.  
**Chassis Price** is for truck with standard wheelbase listed and with tires listed F.O.B. factory, unless otherwise specified.  
**b**—Price of Mack AC 7-10 ton, \$4,950, tires, S 36x5, DS 40x5; 11-14 ton, \$5,500, tires, S 36x6, DS 40x6; 15 ton, \$6,000, tires S 36x7, DS 40x7.

### TIRES

**B**—Balloon.  
**DB**—Dual Balloons standard equipment.  
**P**—High Pressure Pneumatics standard equipment.  
**DP**—Dual High Pressure Pneumatics standard equipment.  
**S**—Solids.  
**DS**—Dual Solids.  
**V**—Pneumatics furnished at extra cost.

### ENGINE

#### Make

**Bud**—Buda Company.  
**Con**—Continental Motors Corp.  
**Has**—American Car & Fdy. Co.  
**Her**—Hercules Motor Corp.  
**Lyc**—Lycoming Motor Corp.  
**Wau**—Waukesha Motor Co.  
**Wis**—Wisconsin Motor Mfg. Co.

### Valve Arrangement

**H**—In head.  
**L**—“L” Head.  
**S**—Sleeve.  
**T**—“T” Head.

### Camshaft Drive

**C**—Chain.  
**G**—Gear.

### Piston Material

**A**—Aluminum alloy.  
**B**—Semi-steel.  
**C**—Cast iron.  
**N**—Nickel iron.  
**S**—Aluminum alloy with strut.

### Oiling System

**CC**—Pressure to main, connecting rod and camshaft bearings.  
**FP**—Pressure to main, connecting rod, camshaft bearings and piston pins.  
**PC**—Pressure to mains and connecting rod bearings.  
**PG**—Pump, gravity and splash.  
**PS**—Pressure with splash.  
**SP**—Circulating with splash.

### Governor

**Bf**—Bethlehem Fabricators, Inc.  
**Bu**—Buda  
**Co**—Continental.  
**Ha**—Handy Governor Co.  
**HS**—Amer. Car & Fdy. Co.  
**KP**—Handy Governor Co.  
**Mo**—Monarch.  
**No**—Not supplied.  
**On**—Own.  
**Op**—Optional.  
**Pe**—Pierce Governor Co.  
**Si**—Simplex (Eisemann Magneto Corp.)  
**St**—Sterling.  
**Wa**—Waukesha.

### Radiator

**Bus**—Bush Mfg. Co.  
**Chi**—Chicago Mfg. Co.  
**Fed**—Feeders Mfg. Co.  
**G&O**—G & O Mfg. Co.  
**Har**—Harrison Rad. Corp.  
**Hex**—Hexcel Rad. Co.  
**Lon**—Long Mfg. Company.  
**McC**—McCord Rad. & Mfg. Co.  
**Mod**—Modine Mfg. Co.  
**Per**—Perfex Corp.  
**R-T**—Rome-Turney Rad. Co.  
**You**—Young Rad. Company.

### FUEL SYSTEM

#### Carburetor Make

**Car**—Carter Carburetor Co.  
**John**—Johnson.  
**Mar**—Marvel Carburetor Co.  
**Sch**—Wheeler Schebler Co.

**Ste**—Detroit Lubricator.  
**Str**—Stromberg Motor Dev. Co.  
**Til**—Tillotson Mfg. Co.  
**Zen**—Zenith-Detroit Corp.

### Fuel Feed

**E**—Electric Pump.  
**G**—Gravity.  
**M**—Mechanical Pump.  
**P**—Pressure.  
**V**—Vacuum.

### ELECTRICAL SYSTEMS

#### Ignition System, Generator and Starter Make

**A-Bo**—Amer. Bosch Magneto Co.  
**R-Bo**—Robert Bosch Magneto Co.  
**Apo**—Apollo Magneto Corp.  
**D-R**—Delco Remy Company.  
**Eis**—Eisemann Magneto Corp.  
**L-N**—Leece-Neville Co.  
**N-E**—North East Elec. Co.  
**Spl**—Splitdorf Electrical Co.  
**1**—Generator and Starter at extra cost.  
**2**—Starter not supplied. Generator at extra cost.  
**3**—Starter at extra cost.

### CLUTCH

#### Type and Make

**D**—Multiple disk.  
**dp**—Double Plate.  
**O**—Plate in oil.  
**P**—Single plate.

### Make

**B&B**—Borg & Beck Co.  
**B-L**—Brown-Lipe Gear Co.  
**Cla**—Clark Equipment Co.  
**Cov**—Covert Gear Co.  
**D-G**—Detroit Gear & Mach. Co.  
**Ful**—Fuller & Sons Mfg. Co.  
**H-S**—Merchant & Evans Co.  
**Lon**—Long Mfg. Company.  
**M-E**—Merchant & Evans.  
**M.M.**—Mechanics Mach. Co.  
**Mun**—Muncie Products Div. General Motors Corp.  
**Roc**—Rockford Drill Machine Co.  
**W-G**—Warner Gear Co.

### GEARSET

#### Make and Model

**B-L**—Brown-Lipe Gear Co.  
**Cla**—Clark Equipment Co.  
**Cov**—Covert Gear Co.  
**D-G**—Detroit Gear & Mach. Co.  
**Ful**—Fuller & Sons Mfg. Co.  
**M.M.**—Mechanics Mach. Co.  
**Mun**—Muncie Products Div. General Motors Corp.  
**W-G**—Warner Gear Co.

### Location

**A**—Amidships.  
**J**—Unit with Jackshaft.  
**U**—Unit with engine.  
**—**Not furnished.  
**O**—Optional at extra cost.  
**A**—Amidships.  
**R**—Rear of amidships main transmission.  
**U**—Unit with engine.

### Auxiliary, Location and Number of Speeds

**—**Not furnished.  
**O**—Optional at extra cost.  
**A**—Amidships.  
**R**—Rear of amidships main transmission.  
**U**—Unit with engine.

### UNIVERSAL JOINTS

**Blo**—Blood Bros. Mach. Co.  
**B-C**—Blood and Cleveland.  
**Cle**—Cleveland Steel Prod. Corp.  
**Har**—Spicer Mfg. Co.  
**M.M.**—Mechanics Machine Co.  
**Pes**—Peters and Spicer.  
**Pet**—Peters.  
**P-S**—Peters and Shead.  
**S-C**—Spicer and Cleveland.  
**Spi**—Spicer Mfg. Co.  
**S-P**—Superior Universal Products Co.  
**SpB**—Spicer and Blood Bros.  
**SpP**—Spicer and Pick.  
**S-T**—Spicer & Thermold.  
**U-M**—Universal Machine Co.  
**U-P**—Universal Products Co.

### REAR AXLE

#### Make

**Cla**—Clark Equip. Co.  
**Col**—Columbia Axle Co.  
**Con**—Continental Axle Co.  
**Eat**—Eaton Axle Co.  
**Sal**—Salsbury Axle Co.  
**Tim**—Timken Det. Axle Co.  
**Wis**—Wisconsin Axle Co.

### Final Drive and Type

**B**—Bevel.  
**C**—Chain.  
**D**—Dead.  
**I**—Internal Gear.  
**2**—Double Reduction.  
**R**—Relay—Pendulum Drive.  
**S**—Spiral Bevel.  
**W**—Worm.  
**1/2**—Semi-Floating.  
**3/4**—Three-Quarter Floating.  
**F**—Full Floating.

### Drive and Torque

**H**—Hotchkiss.  
**R**—Radius Rods.  
**T**—Torque Arm.  
**U**—Torque Tube.  
**O**—Radius Rods Optional.

### WHEELS DRIVEN

**2**—Forward pair of rear wheels.  
**4F**—Front wheels and forward pair of rear wheel.  
**4R**—Four rear wheels.  
**6**—Six wheels.

### FRONT AXLE

#### Make and Model

**Shu**—Shuler Axle Co., Inc.  
**Cla**—Clark Equipment Co.  
**Col**—Columbia Axle Co.  
**Con**—Continental Axle Co.  
**Eat**—Eaton Axle Co.  
**Sal**—Salsbury Axle Co.  
**She**—Sheldon.  
**Tim**—Timken Det. Axle Co.  
**Wis**—Wisconsin Axle Co.

### BRAKES

#### Service Make

**B**—Bendix.  
**BE**—Bendix front, Eaton rear.  
**BO**—Bendix front, Own rear.  
**C**—Columbia.  
**K**—Clark.  
**L**—Lockheed.  
**LO**—Lockheed front, Own rear.  
**O**—Own.  
**OE**—Own front, Eaton rear.  
**OW**—Own front, Wisconsin rear.  
**S**—Steeldraulic.  
**T**—Timken.  
**W**—Wisconsin.

### Location

**2**—Two Wheel.  
**4**—Four Wheel.  
**6**—Six Wheel.  
**2/4**—Two wheel brakes effective on all four wheels through driveshaft.  
**P**—Driveshaft.  
**J**—Jackshaft.  
**P**—Propeller shaft.  
**P/4**—Propeller shaft effective on four wheels.  
**r**—Four rear wheels.

### Type

**I**—Internal.  
**V**—Internal front and external rear.  
**X**—External.

### Method of Operation

**A**—Air.  
**D**—Hydraulic and mechanical.  
**H**—Hydraulic.  
**M**—Mechanical.  
**V**—Vacuum.

### Hand

#### Location

**C**—Center of double propeller shaft.  
**2**—Rear wheels.  
**4**—Four wheels.  
**R**—Worm or bevel gear shaft.  
**T**—Transmission.  
**F**—Driveshaft.

### Type

**D**—Disk.  
**I**—Internal.  
**X**—External.  
**V**—Internal front and external rear.

### STEERING GEAR

#### Make

**CAS**—Columbus G. & P. Co.  
**Gem**—Gemmer Mfg. Co.  
**Han**—Hannum Mfg. Co.  
**Jac**—Saginaw Steering Gear Div. General Motors Corp.  
**Lav**—Hannum Mfg. Co.  
**Ros**—Ross Gear & Tool Co.  
**Woh**—Wohlrab Gear Co.

### FRAME

**Dimensions** Side Rail Depth, Width of Flange, Thickness of Stock

### Type

**C**—Channel.  
**I**—“I” Beam.  
**P**—Channel reinforced with plate.  
**T**—Side rails tapered front and rear.

### SPRINGS

#### Auxiliary

#### Type

**1/2**—Semi-elliptic above or below main springs.  
**1/4**—Quarter elliptic.  
**C**—Coil spring.

MODEL	STRAIGHT RATING	TYPE NUMBERS	RANGE OF PAYLOAD (TONS)
T-11	3800 lbs.	1001	1/2
T-15	5400 lbs.	1501 to 1503	3/4
T-17	6500 lbs.	1701 to 1708	1 to 1 1/2
T-19	8500 lbs.	2201 to 2218	1 to 2
T-25	8500 lbs.	2501 to 2513	1 to 1 1/4
T-30	11000 lbs.	3201 to 3214	1 1/2 to 2 1/2
T-42	14000 lbs.	4201 to 4212	2 to 3 1/2
T-44	15000 lbs.	4401 to 4412	2 to 4
T-60	18500 lbs.	6201 to 6218	2 1/2 to 4 1/2
T-82	22000 lbs.	8201 to 8212	3 to 6
T-90	28000 lbs.	9001 to 9007	5 to 7 1/2

# WHAT YOU HAVE WAITED FOR! Commercial Car Lacquer developed by ACME

*Startling new lacquer discovery is first practical lacquer system for trucks and other commercial cars*

Commercial Car Lacquer is in a class by itself! No other product even barely resembles it. Only Acme could develop it to its high degree of perfection.

With it refinishers can get startlingly beautiful results—results that were formerly thought impossible.

Commercial Car Lacquer is the one practical and successful lacquer finish for trucks and used cars. It dries quickly to a beautiful gloss *without polishing*. Think of the labor this saves you.

You need no new equipment to apply it. Sprays on easily. Can be applied on wood or metal over an old lacquer finish or old paint or varnish finish. Easily outlasts varnish. Saves a lot of time on two-tone work because there is no long waiting for masking. Successive coats can be applied with a minimum loss of time. 100% reduction with Proxlin Thinner also lowers costs.

Absolutely non-injurious to health. No slow drying spray dust as is the case with an oil base product. Cleaner for the mechanic. Eliminates damage to other equipment.

Commercial Car Lac-



quer is, of course, permanent and non-bleeding. Even the vermillion will neither fade nor bleed through subsequent coats or lettering.

You will find it saves a great amount of time and money because it enables you to get cars and trucks out in record time, to say nothing about the extra satisfaction you give your most particular customers.

Commercial Car Lacquer, like all Acme products, is priced fairly. Prices of Commercial Car Lacquers are as follows:

Black	-\$-\$-\$-\$	\$5.00 a gallon
Regular colors	-\$-\$-\$-\$	\$6.00 a gallon
White & Vermilion	-\$-\$-\$-\$	\$7.50 a gallon

*It is available in eight standard truck colors*

#### ACME WHITE LEAD AND COLOR WORKS

*(Proxlin Division)*

DETROIT

MICHIGAN

#### *Read these amazing advantages:*

1. Dries to a beautiful gloss without labor of polishing. Saves clear gloss lacquer cost.
2. Permanent, non-bleeding. Outlasts varnish. Carries 100% reduction.
3. Not injurious to health. No special room needed. Dries as soon as it hits surface.
4. No new lacquer equipment needed to apply it. Solid covering.
5. Speedy system. No long tie-up of equipment and space.

and Improve the  
Appearance of Your Fleet

## CUT YOUR FINISHING COSTS



COMMERCIAL CAR LACQUER

# These jobbers sell Acme Quality Commercial Car Lacquer Send your order to them

## ALABAMA

Ozburn-Abston & Co. - - - - - Huntsville  
Allen & Jemison Co. - - - - - Tuscaloosa

## ARKANSAS

Ozburn-Abston & Co. - - - - - Jonesboro  
The Voss-Hutton Co. - - - - - Little Rock

## CALIFORNIA

H. M. Miller Co. - - - - - Anaheim  
Auto Gear & Supply Co. - - - - - El Centro  
H. M. Miller Co. - - - - - Fullerton  
Holland Auto Service - - - - - Highland Park  
Shaefer's Battery & Ignition  
Co. - - - - - Hollywood

The Banta Co. - - - - - Los Angeles  
Stanislaus Auto Supply Co. - - - - - Merced  
Stanislaus Auto Supply Co. - - - - - Modesto  
Peninsula Auto Parts Co. - - - - - Monterey  
Waterhouse-Weinstock-Scovel  
Co. - - - - - Oakland

Hibbard & Baylor - - - - - Pasadena  
Inwood & Greene - - - - - Petaluma  
Ranchers' Mfg. Co. - - - - - Pomona  
Button-Hall Rubber Co. - - - - - Redlands

Auto Gear & Supply Co. - - - - - San Diego  
Waterhouse-Weinstock-Scovel  
Co. - - - - - San Francisco

Standard Parts Co. - - - - - San Luis Obispo  
Turk & White - - - - - Santa Ana

J. A. Van Horn - - - - - Santa Barbara  
A. W. Feltz - - - - - Santa Maria

E. C. Kraft & Co. - - - - - Santa Rosa  
Stanislaus Auto Supply Co. - - - - - Stockton  
National Auto Parts Co. - - - - - Vallejo  
Motor Parts Co. - - - - - Ventura

Whittier Motor Parts - - - - - Whittier  
H. M. Parker - - - - - Glendale

## COLORADO

The Auto Equipment Co. - - - - - Denver

## CONNECTICUT

The C. S. Mersiek & Co. - - - - - New Haven

## FLORIDA

The Consolidated Automotive  
Co. - - - - - Gainesville

The Consolidated Automotive  
Co. - - - - - Jacksonville

Berner-Pease Co. - - - - - Miami

The Consolidated Auto. Co. - - - - - Orlando

Owen-Nicholas Co., Inc. - - - - - Tampa

The Consolidated Automotive  
Co. - - - - - West Palm Beach

The Consolidated Automotive  
Co. - - - - - Tallahassee

## GEORGIA

A. R. Mustin Automotive Co. - - - - - Augusta  
Beck & Gregg Hardware Co. - - - - - Atlanta  
Butler Bros. Co., Inc. - - - - - Columbus  
A. S. Hatcher Co. - - - - - Macon

The Frank Corporation - - - - - Savannah

## IDAHO

Bertram Motor Supply Co. - - - - - Boise  
Inter-Mountain Elec. Co. - - - - - Pocatello  
Simpson Battery Co. - - - - - Idaho Falls

## ILLINOIS

E. B. Collins Co. - - - - - Bloomington  
E. B. Collins Co. - - - - - Champaign  
Motor Car Supply Co. - - - - - Chicago  
Unid Motor Parts Co. - - - - - Chicago

E. B. Collins Co. - - - - - Danville

Fred Campbell Auto Sup. Co. - - - - - Decatur  
Central Auto Equip. Co. - - - - - Jacksonville  
Trackman Auto Supply Co. - - - - - Joliet  
Super Service Auto Parts, Inc. - - - - - La Salle

Sieg Company - - - - - Moline

National E. & A. Supply Co. - - - - - Peoria

Central Auto Equipment

Co. - - - - - Springfield

Tenk Hardware Co. - - - - - Quincy

Fred Campbell Auto Supply

Co. - - - - - West Frankfort

Duquin Auto Supply Co. - - - - - Duquin

## INDIANA

Boetticher & Kellogg Co. - - - - - Evansville

Ford Wayne Iron Store Co. - - - - - Fort Wayne

Stained Auto Parts - - - - - Hammond

Central Bus. & Sup. Co. - - - - - Indianapolis

Ridenour Auto Supply Co. - - - - - Kokomo

E. B. Collins Co. - - - - - Lafayette

Howard Cranfill Co., Inc. - - - - - South Bend

Fred Campbell Auto Supply

Co. - - - - - Terre Haute

Miller Bros. Hardware Co. - - - - - Richmond

## IOWA

Robert Donahue Co. - - - - - Burlington

Sieg Company - - - - - Davenport

Wm. H. Metz Co. - - - - - Des Moines

J. W. Edgerly & Co. - - - - - Ottumwa

W. A. Walbert Co. - - - - - Sioux City

## KANSAS

The Carl Graham Co. - - - - - Arkansas City

Barnhills Co. - - - - - Eldorado

Ragland-Kingsley Motor Co., Hutchinson

Southwick Autom. Sup. Co. - - - - - Topeka

Carl Graham Paint & Wall Paper

Co. - - - - - Wichita

The Carl Graham Co. - - - - - Wichita

## KENTUCKY

Davidson Brothers - - - - - Bowling Green

Marshall Auto Supply Co. - - - - - Covington

Davidson Brothers - - - - - Glasgow

Wm. E. Pruden Co. - - - - - Lexington

Stratton & Tersege Co. - - - - - Louisville

Fred Campbell Auto Sup. Co., Paducah

Auto Sup. & Elec. Co. - - - - - Baton Rouge

David Bernhardt Pt. Co. - - - - - New Orleans

Interstate Electric Co. - - - - - Shreveport

## LOUISIANA

The Owens-Merritt Co. - - - - - Winston-Salem

The Owens-Merritt Co. - - - - - Wilson

The Owens-Merritt Co. - - - - - Youngstown

## MAINE

Rice & Miller - - - - - Bangor

General Equipment Corp. - - - - - Portland

MASSACHUSETTS

Bettridge Speedometer Service, Brockton

Boston Auto Supply Co. - - - - - Lowell

The U and I Auto Supply Co., Lawrence

General Equipment Corp. - - - - - Boston

Berlo Bros. - - - - - Gardner

## MARYLAND

Auto Supply Co. - - - - - Baltimore

## MICHIGAN

Wattles Hardware Co. - - - - - Battle Creek

Howard Cranfill Co., Inc., Benton Harbor

Michigan Autom. Sup. Co. - - - - - Detroit

Cummings Brothers - - - - - Flint

Popp Hardware Co. - - - - - Saginaw

## MINNESOTA

The K-W Supply Co. - - - - - Albert Lea

Kelley-How-Tompson Co. - - - - - Duluth

Minneapolis Iron Store Co., Minneapolis

Williams Hardware Co. - - - - - Minneapolis

## MISSISSIPPI

Milton-Brooks Co., Inc. - - - - - Meridian

Ozburn-Abston & Co. - - - - - Jackson

Ozburn-Abston & Co. - - - - - Tupelo

## MISSOURI

Auto Tire & Parts Co., Cape Girardeau

The Faeth Co. - - - - - Kansas City

Fred Campbell Auto Sup. Co., St. Louis

Hannibal Auto Supply Co. - - - - - Hannibal

## MONTANA

A. M. Holter Hardware Co. - - - - - Helena

## NEBRASKA

Duda-Myers Co. - - - - - Hastings

Duda-Myers Co. - - - - - Norfolk

E. A. Pegau Co. - - - - - Omaha

Duda-Myers Co. - - - - - North Platte

## NEW JERSEY

Norwood Tire Co. - - - - - Atlantic City

Herman Dobbs - - - - - Bayonne

National Auto Accessories

Co. - - - - - East Orange

E. B. Degenring & Co. - - - - - Elizabeth

## INDIANA

## ENAMEL

## PROXLIN

## REGISTERED

## U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

REGISTERED

U. S. PAT. OFF.

ACME QUALITY

PROXLIN

ENAMEL

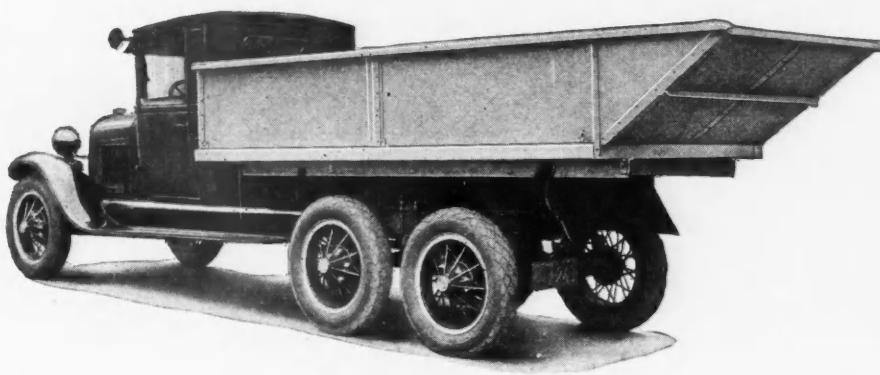
REGISTERED

U. S. PAT. OFF

STRONG TO BEAR BURDENS - LIGHT TO MOVE



900  
POUNDS  
SAVED!



## 64% dead-weight removed

The dump truck presents problems not encountered by the ordinary truck. Designers must provide for maximum efficiency in both its hoisting mechanism and its automotive properties. In each case, weight plays a vital part. Dead-weight means extra strain, slower schedules, shortened life.

The Allegheny Garbage Company of Pittsburgh has proved this to the satisfaction of cost sheets. Alcoa Aluminum bodies on a fleet of their trucks, costing more than the original heavy steel bodies, soon paid for themselves in the time they saved. The needless weight removed allowed more material to be hauled.

The reduction from 1400 pounds per body to 500 pounds per body, with all standards of strength, size and durability retained, is well worth your study. You know what a new lease on life this means to a chassis. Alcoa Aluminum is fast altering the modern conception of body construction. For complete information, write: ALUMINUM COMPANY of AMERICA; 2439 Oliver Building, PITTSBURGH, PA.



# ALCOA ALUMINUM



# Control and Safety sell cars today . . .

You can tell your prospects "This car will do 75"—but you rarely demonstrate that speed.

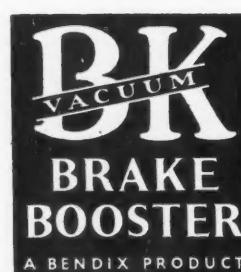
You have in the B-K Vacuum Brake Booster a *plus-control* factor which makes a demonstrated "75 miles an hour" much safer, intensely interesting, and far more convincing.

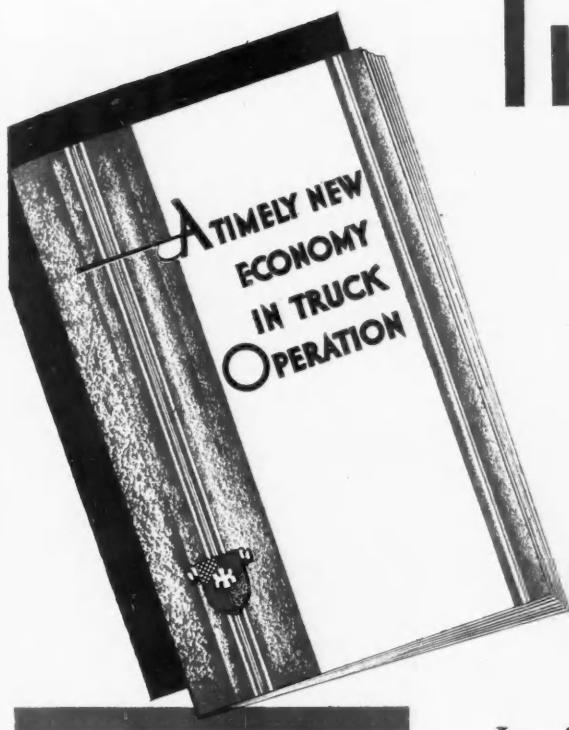
The B-K Vacuum System is simple, dependable and uniform. It utilizes the vacuum from the intake manifold to supply power to the brakes. This power is regulated by pedal depression and is equally applied to each brake; making the stop smooth, quick and steady.

It removes all effort even for the emergency stop—perfect control at a touch of the foot.

Quickly applied to all cars and all kinds of brakes at reasonable cost. Write for facts and figures.

**BRAGG - KLIESRATH CORPORATION**  
Queens Boulevard & Harold Ave., Long Island City, New York  
(DIVISION OF BENDIX AVIATION CORPORATION)





NO "LAY-UP" . . . NO DELAY  
. . . NOTHING "MAKESHIFT"  
WHEN YOU CHANGE-OVER to  
GENERAL TRUCK BALLOONS

General's *complete* line of Truck-Balloons includes a type to replace *every* high-pressure size. You can actually change-over present high-pressure equipment *without changing wheels*.

Your General Tire Dealer is a balloon change-over specialist. He knows the Jumbo Balloon for your job and is properly equipped to replace your present equipment without loss of time. He can change-over trucks from solids in 2 hours or less.

# THIS BOOKLET *answers your questions about* **TRUCK BALLOONS**

In a few quickly read pages it gives you the *complete* story—tells you everything you have wanted to know about the application of balloons to your trucking problems.

It explains the exclusive, patented construction principles underlying the development of the General Jumbo Balloon—shows what this revolutionary new tire has already accomplished in every part of the country on every kind and type of job—estimates conservatively the results you can expect from a change-over.

Thousands of trucks, individually and fleet owned, are rolling on General Balloons—piling up records of savings that challenge *any* comparison. The last few months have literally seen a nation-wide change-over from solids and high-pressure. No tire has ever been so immediately successful and accepted by operators everywhere.

In the interest of sound business economy you should know these important tire facts. Your General Tire Dealer will gladly send you a copy of this booklet, or write to the General Tire and Rubber Company, Akron, Ohio.

*your TIME  
is MONEY*  
*when the . . .*  
**GENERAL**  
*tire man calls*

***The GENERAL  
Jumbo Truck-Balloon***

*—goes a long way to make friends*

# POWER



# WAUKESHA

November, 1930

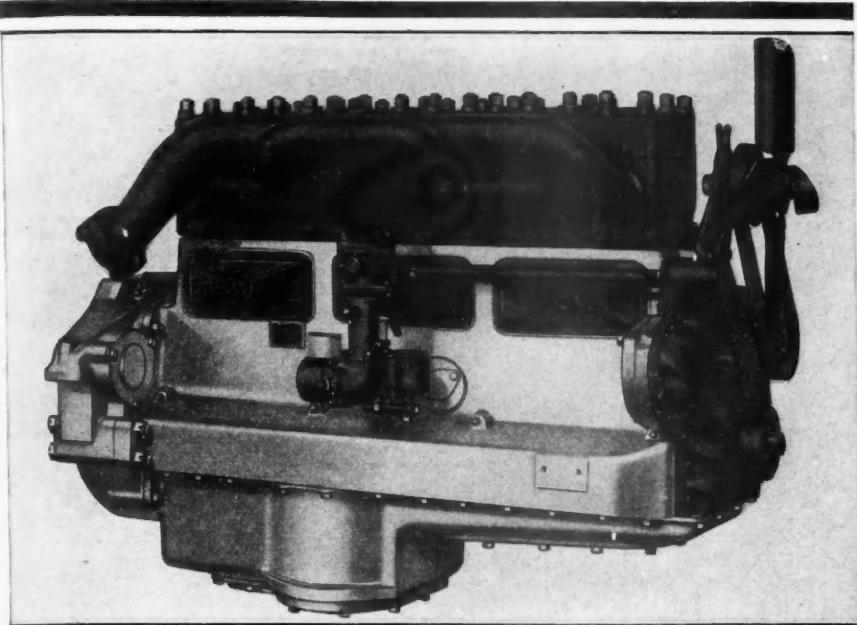
The Commercial Car Journal

True  
if t  
are  
eve  
fast

Two  
field  
pen  
mon  
pow  
Wa

B

The Co



# THAT PAYS PROFITS

Trucks must have power plants in keeping with the times if they are to keep up with the traffic. Waukesha engines are designed for smooth and economical operation at every speed...equal effectiveness at the lower speeds...and faster acceleration at all speeds. And Waukesha combines with all this plenty of pulling power and reserve stamina.

Twenty years of specialized experience in the heavy-duty field has built into Waukesha engines that greater dependability, longer life and easier servicing which give more payload at less cost to owners of Waukesha-powered trucks. Write for new Bulletin No. 827, Waukesha Motor Company, Waukesha, Wisconsin.

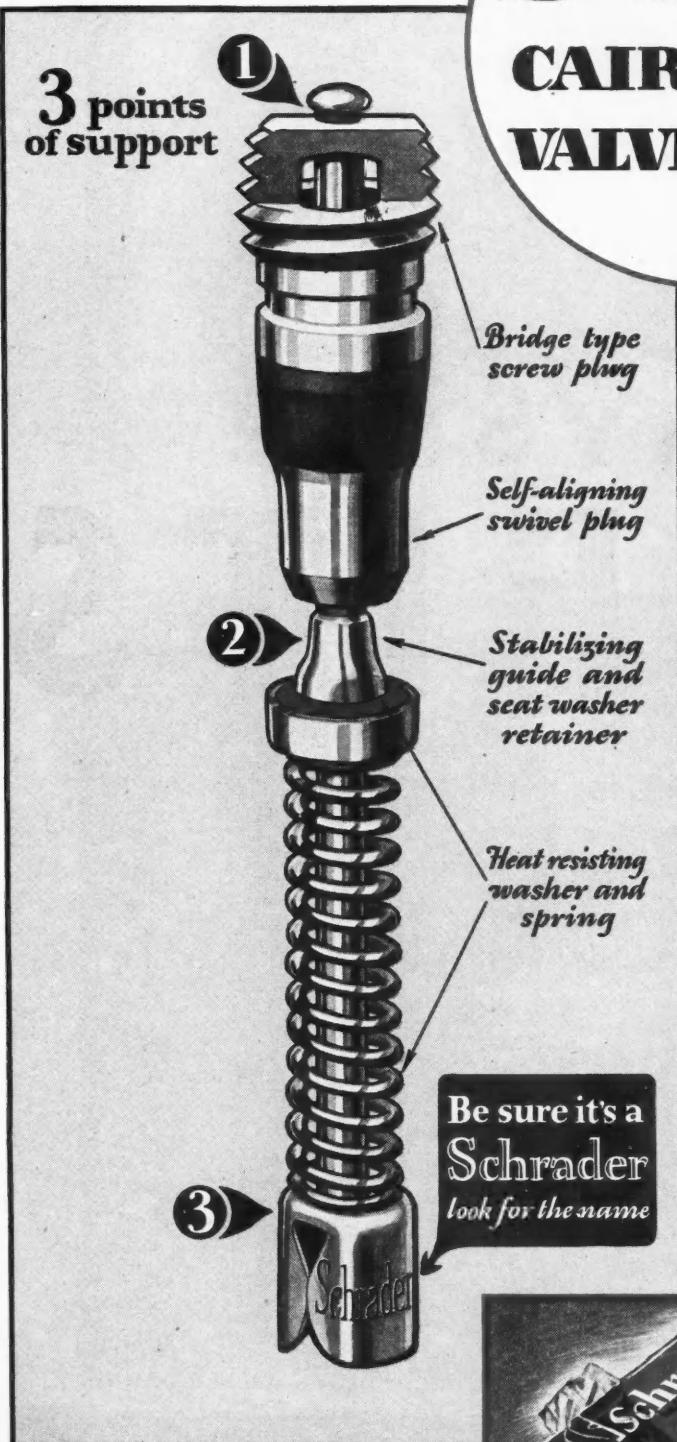
# ENGINES...

»

## THE NEW SPECIAL

# Schrader

## CAIR-FREE VALVE CORE (NO. 6000)



"CAIR-FREE" on Cellophane-wrapped box identifies the new special Schrader Valve Core package

## WHY A NEW CORE?

Busses and trucks with heavy pneumatic tires have brought new problems into the tire industry; greater loads at continual high speeds develop unusual conditions and generate excessive heat. Nearly two years ago Schrader developed for this purpose a special new valve core, which has triumphantly met the final test of the hardest kind of daily use. This new "Cair-Free" core is being used increasingly by tire manufacturers as standard equipment to meet similar demands in passenger automobiles, because its rugged construction gives more than ordinary dependability even under extraordinary conditions. This still-better Schrader Core is now offered for the first time to the replacement trade.

In addition to its other new features of design, the large, free air passages give it unheard-of rapidity of inflation and deflation.

## FOR YOU—

*More profit per sale* — in percentage and in money—because it retails at 40c per box of four.

*More sales* — motorists will be reading the story in our regular consumer advertising. Sell them a full box for immediate replacement.

*No more free cores* when repairing tires—its price justifies charging for it instead of including it "free" with the job.

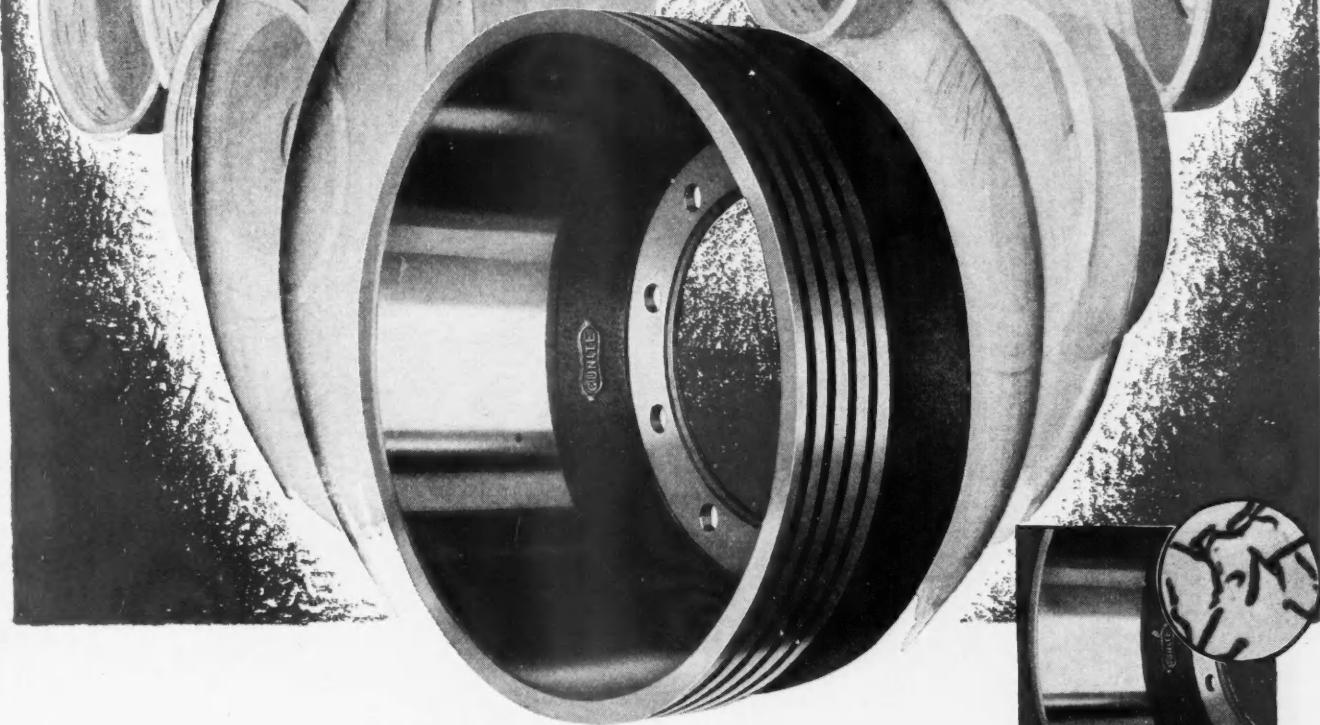
*Speed in the shop and better-pleased customers.* Order through your regular supply house. A. Schrader's Son, Inc. . . . Brooklyn, Chicago, Toronto, London.



**Schrader**  
Makers of Pneumatic Valves Since 1844

Tire Valves ▶ Tire Gauges

# AS GOOD AS GUNITE?



FOR every type of product there must be a standard of comparison. Among brake drums it is the Gunite Drum. Everywhere knowing men now ask of other brake drums "Are they as good as Gunite?" Most fleet operators and maintenance men, further, demand Gunite Drums as standard equipment on new additions to their fleet and carry out a regular plan of replacing old, worn drums with Gunite Drums . . . refuse to take chances with old types or "just-as-good" drums.

Gunite Brake Drums set totally new standards for brake drum performance by giving more than 100,000 miles of service *without machining*. Where ordinary cast or pressed steel drums bend, score and groove within a short 20,000 miles, Gunite Drums stay smooth as satin, never roughen, never bulge out of round . . . even at *five to ten times* that mileage!

Because of the very nature of Gunite, brake drums cast of it cannot warp or distort under the hardest service. The graphite content of this new metal acts as a natural lubricant to keep the braking surfaces of the drum continuously *smooth* . . . for more than 100,000 miles! Before Gunite Drums come to you they are carefully tested and drilled to *fit* your particular model of bus or truck. Every Gunite Drum made is held to .009 of an inch concentricity . . . a roundness that makes brake adjustments easy to make and maintain.

Order a set of Gunite Drums. Once you've used them you'll never go back to any other drum. The Gunite catalog, listing every model of bus or truck, is sent free on request. Ask for a copy.

THE GUNITE CORPORATION  
Rockford, Illinois

# GUNITE BRAKE DRUMS



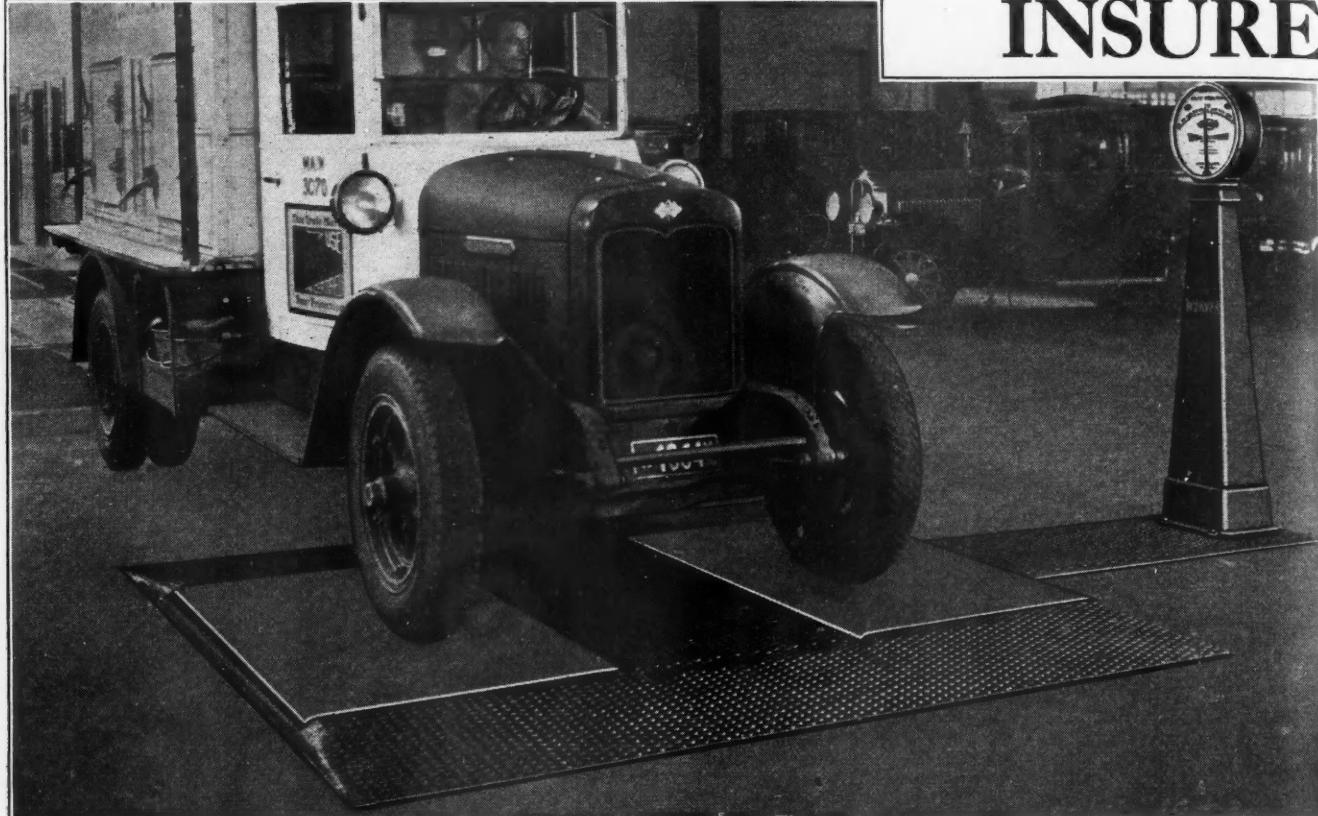
In the circle, a micro-photograph of the molecular structure of Gunite magnified 100 diameters, showing the even distribution of the uniform, fat flakes of graphite which give to Gunite its superior wearing qualities.

The ferrous matrix of Gunite is essentially the same as tool steel, being lamellar "Pearlite." Pure steel, however, has undesirable features under friction which the short, fat flakes of graphite, evenly distributed in Gunite, overcome. The "stickiness" is eliminated and drums of Gunite cannot score, tear or grab other materials.

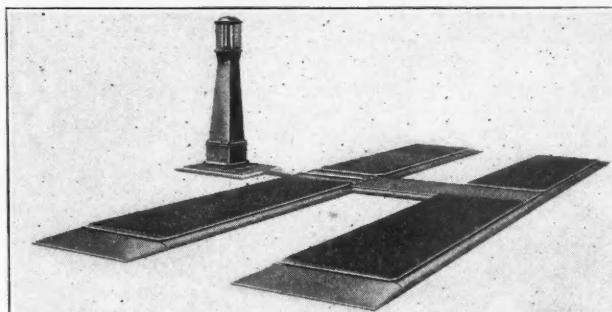
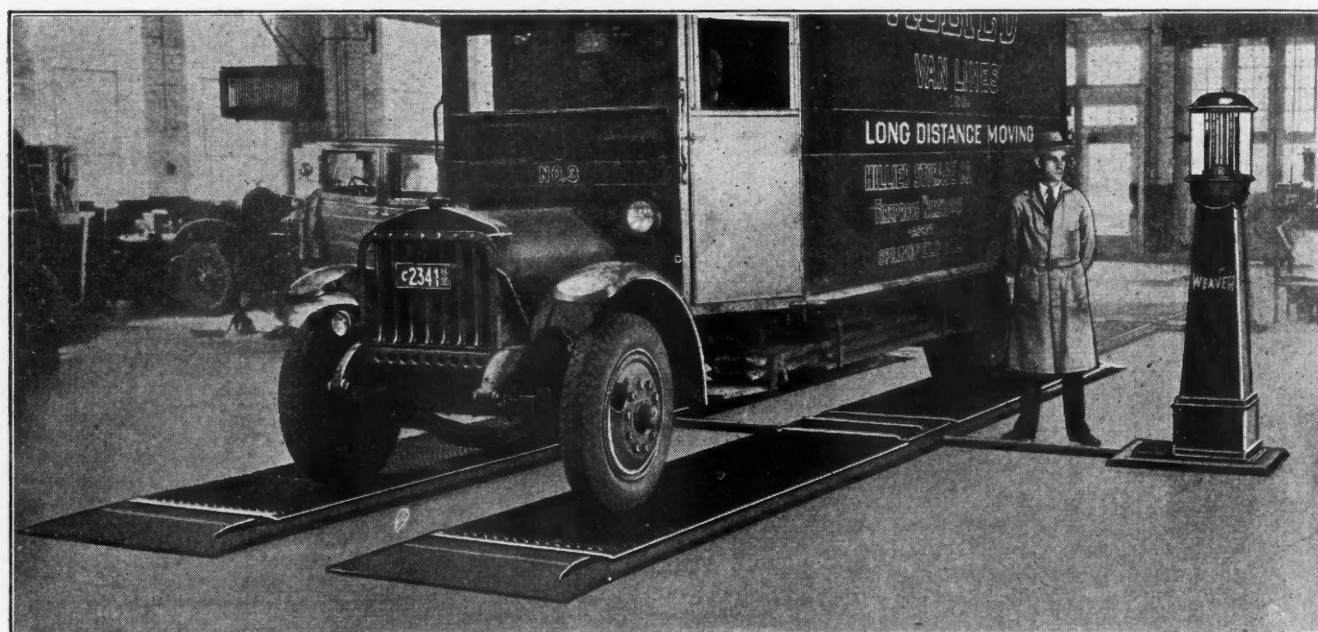
The Gunite Drum catalog is sent free on request. Keep a copy in your files and order Gunite Drums on every replacement.



## INSURE



Weaver Automatic Wheel Alignment Indicator



Weaver Automatic Brake Tester

Easily installed either inside shop or out-of-doors.  
Lies flat—Easy to drive on and off—Drivers can make own tests.

Weaver Automatic Brake Tester  
Checks truck under actual driving conditions.

The automatic features of both the Weaver Brake Tester and Wheel Alignment Indicator and the consequent saving in time are features for every truck operator to consider. This equipment will not only handle the largest of trucks, but also can be used to test buses and passenger cars.



# GREATER SAFETY—

*reduce operating costs  
with*

# WEAVER

## *Equipment*

Play safe . . . Have your drivers check brakes and wheel alignment every day . . . It only takes a few seconds when Weaver equipment is used.

The new Weaver Automatic Brake Tester is especially designed to handle any truck. It tests all brakes instantly, simultaneously and accurately. It lies flat and the operator simply drives over the plates, sets the brakes and the true braking ratio is immediately recorded on the gauges.

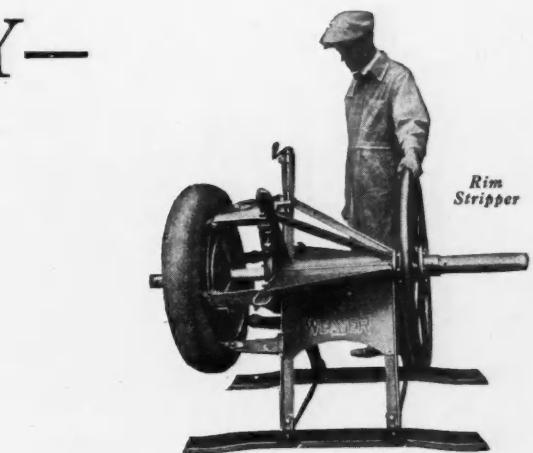
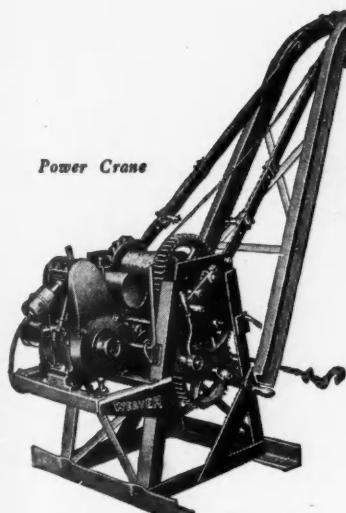
In addition to insuring greater safety on the road, you can also cut operating costs by effecting a greater saving in tires, gas and oil by making sure that wheels are in correct alignment. The new Weaver Automatic Wheel Alignment Indicator has a definite place in every shop. If a truck is driven over the plates of the Tester the number of feet of side drag per mile on the tires is automatically indicated on a large dial which the driver can see without leaving his seat.

If you are interested in reducing accidents, reducing road repairs and keeping trucks in the best of condition at the lowest cost per mile—write for additional information on Weaver equipment designed for truck maintenance service. A complete catalog will be sent on request.

### WEAVER MANUFACTURING COMPANY

Springfield, Ill., U. S. A. Weaver Canadian Co., Ltd., Chatham, Ont.

*Power Crane*

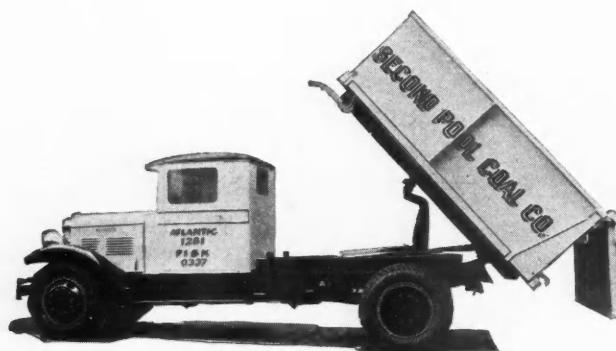


C.C.J.—11-30



A fleet of five White Model 51A chassis with 3 1/2-yd. bodies equipped with Model 7UB St. Paul Underbody Hydraulic Hoists for Cleveland Builders Supply Co., by The Ohio Truck Body & Wagon Co. of Cleveland.

## "Expense Minimums"



Brockway Motor Truck Model 195 equipped with Model 7UB St. Paul Underbody Hydraulic Hoist and Special Coal Body by the Schnabel Co. of Pittsburgh.

If you have a new truck or an old truck, a heavy truck or a light truck—there is a St. Paul Hoist for it.

The inevitably long minutes spent in transporting the load, whatever it is, end abruptly in the split seconds of dumping with St. Paul Hoists. The unloading part of your operations is thus definitely reduced to an *expense minimum*, just a matter of seconds. This great saving of time and labor, by quick dumping, shows up in your books in money saved and profits earned.

"Ask the Dump Truck Driver on the Job"

**=St. Paul=**  
VERTICAL AND UNDERBODY  
HYDRAULIC HOISTS

St. Paul Hydraulic Hoist Company

Factories at St. Paul, Minnesota

A St. Paul Hoist Distributor and Service Station is near you. Write for name and address.



## The FAMOUS 57 Varieties travel on White Trucks

Quality in the manufacture of pure food products has been the keystone in building the world-wide business and reputation of the H. J. Heinz Company. To maintain this quality there is constant supervision and immaculate cleanliness throughout the Company's 25 factories and over 85 sales branches and warehouses everywhere.

Heinz draws its raw materials from the markets of the world and sends its finished products to the markets of the world.

Even the seeds are specially grown that produce the Heinz crops that require an army of over 200,000 people to harvest. It is a policy of long standing that the distribution and delivery of the famous "57 Varieties" must reflect the same high standards of quality that go into their manufacture.

To meet these exacting requirements, the H. J. Heinz Company operates a fleet of over 100 White Trucks. Truck routes and schedules are planned with

perfect regularity. Customers know and depend on Heinz service, and White Trucks keep that service dependable.

Every truck in the Heinz fleet must operate at a specified percentage of sales, and the efficient and economical operation of these Whites keeps this percentage at the lowest possible figure.

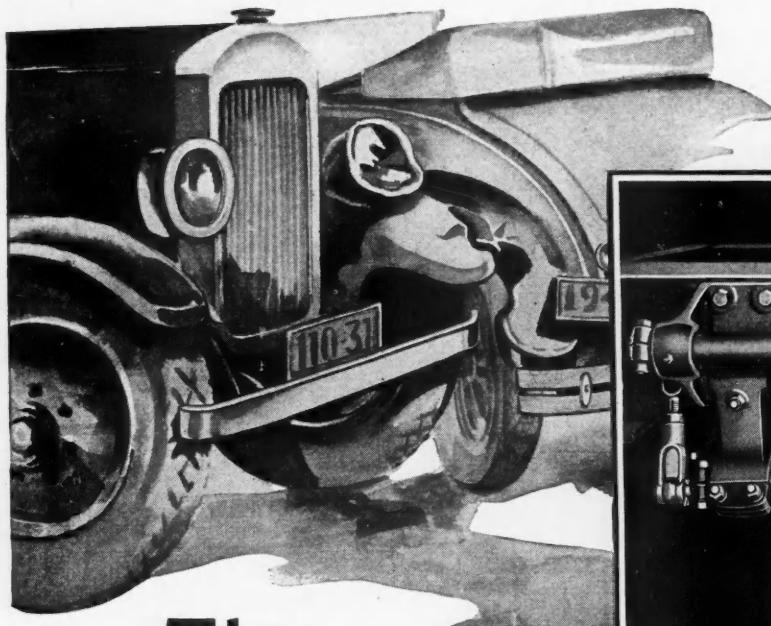
In every line of business you will find White Trucks delivering the same kind of low-cost transportation that has built the great Heinz fleet.

THE WHITE COMPANY, CLEVELAND

# WHITE

A COMPLETE LINE OF FOUR AND SIX CYLINDER

## TRUCKS BUSSES

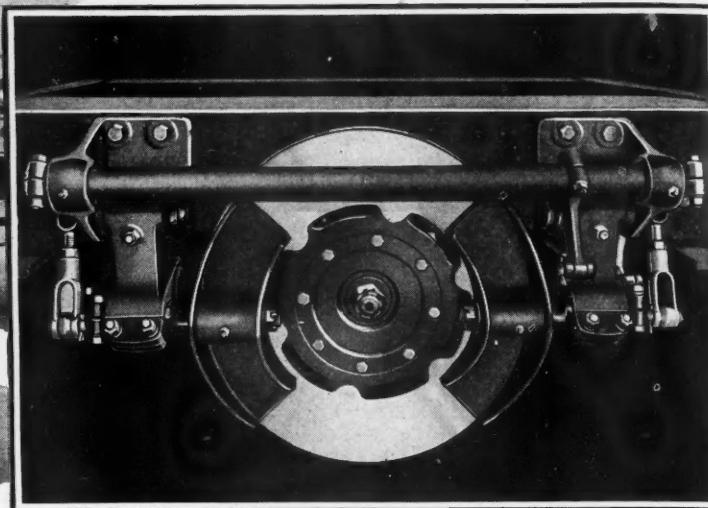


**This  
wouldn't  
happen  
with a real emergency brake**

**Easy to Service . . .**

Natural lining wear can be taken up in a few minutes—on the road if necessary, by any driver. A complete relining job takes less than half an hour. Tru-Stop Emergency Brakes are self equalizing—non-self energizing and they will not grab or chatter.

**Won't grab  
Positive action  
Positive release  
Dissipates heat  
2 minutes to adjust  
20 minutes to reline  
Interchangeable parts**



Service brakes sometime fail at the wrong time. Every truck and bus should be equipped with an efficient emergency brake—one that is capable of handling any load at any speed.

The TRU-STOP Emergency Brake is more than a parking brake. It will control a heavy load at any speed. Specify TRU-STOP Emergency Brake Equipment for your next bus or truck.

**AMERICAN CABLE COMPANY, Inc.**

*Automotive Division*

Bridgeport, Conn. 3-111 General Motors Bldg., Detroit, Mich.

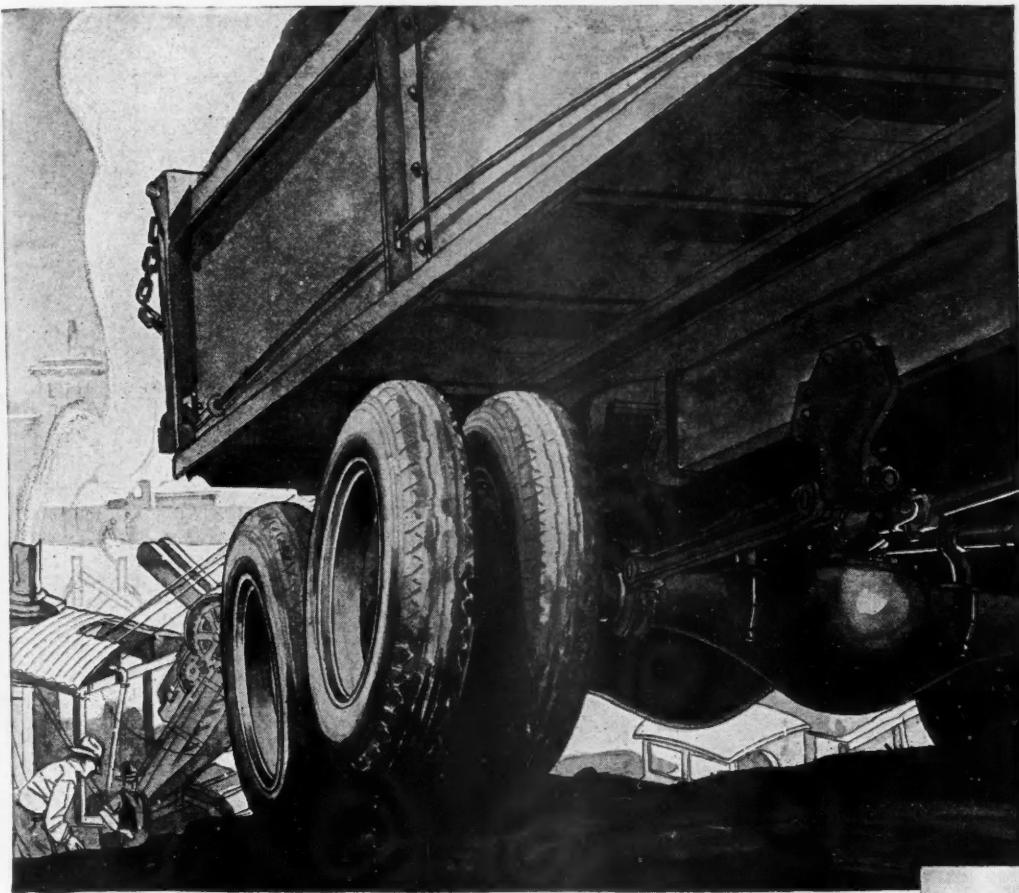


**Modernize your present emergency brake**

Old type band and drum propeller shaft brakes can be easily replaced with Tru-Stop Emergency Brakes on practically all trucks and buses.

Detailed installation instructions are furnished with every Tru-Stop Emergency Brake. Write for information, telling us the make, year and model of your truck or bus.

**TRU - STOP**  
**A REAL EMERGENCY BRAKE**

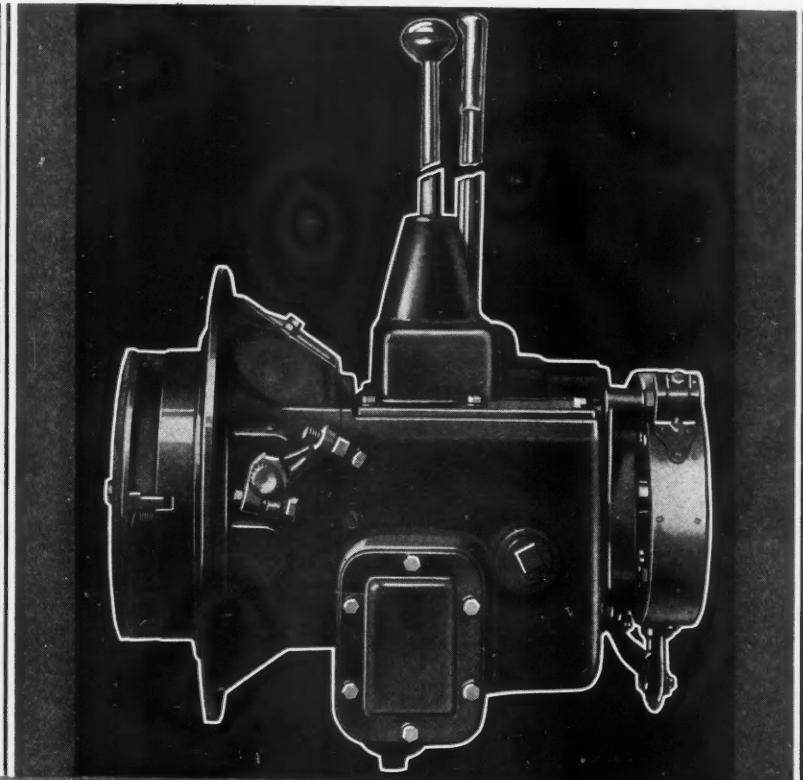


## There with the "wallop"

Human champions wear out. ¶ The hour comes when old legs rebel—can't respond; and the famous punch can't break a window. Youth is served. ¶ But the Timken Six-Wheel Unit?—two trucks in one; with the perennial youth of Timken Worm Drive; wearing in—not out; always high in efficiency throughout its long and useful life. ¶ The legs are there—extra traction, greater brake capacity; a weaving flexibility that conserves every working part. ¶ And "the wallop"! ¶ What happens to hauling costs is plenty.



**TIMKEN**  **SIX WHEEL UNIT**  
 THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.



No. 214. Four speeds forward and one reverse. For 1 to 1½-ton speed trucks. Roller bearings throughout, except rear mainshaft which is ball.

# BROWN-LIPE

LONG THE STANDARD FOR  
QUALITY IN THE AUTOMO-  
TIVE INDUSTRY — BROWN-  
LIPE NOW OFFERS THE  
FINEST LINE OF TRANS-  
MISSIONS AND CLUTCHES  
IN ALL ITS HISTORY.



## ASSOCIATED *Spicer* COMPANIES

**BROWN-LIPE**  
CLUTCHES and  
TRANSMISSIONS

**BROWN-LIPE GEAR CO.**  
SYRACUSE NEW YORK

November, 1930

**SALISBURY**  
FRONT and REAR  
AXLES

**SPICER MFG. CORP.**  
TOLEDO

**SPICER**  
UNIVERSAL  
JOINTS

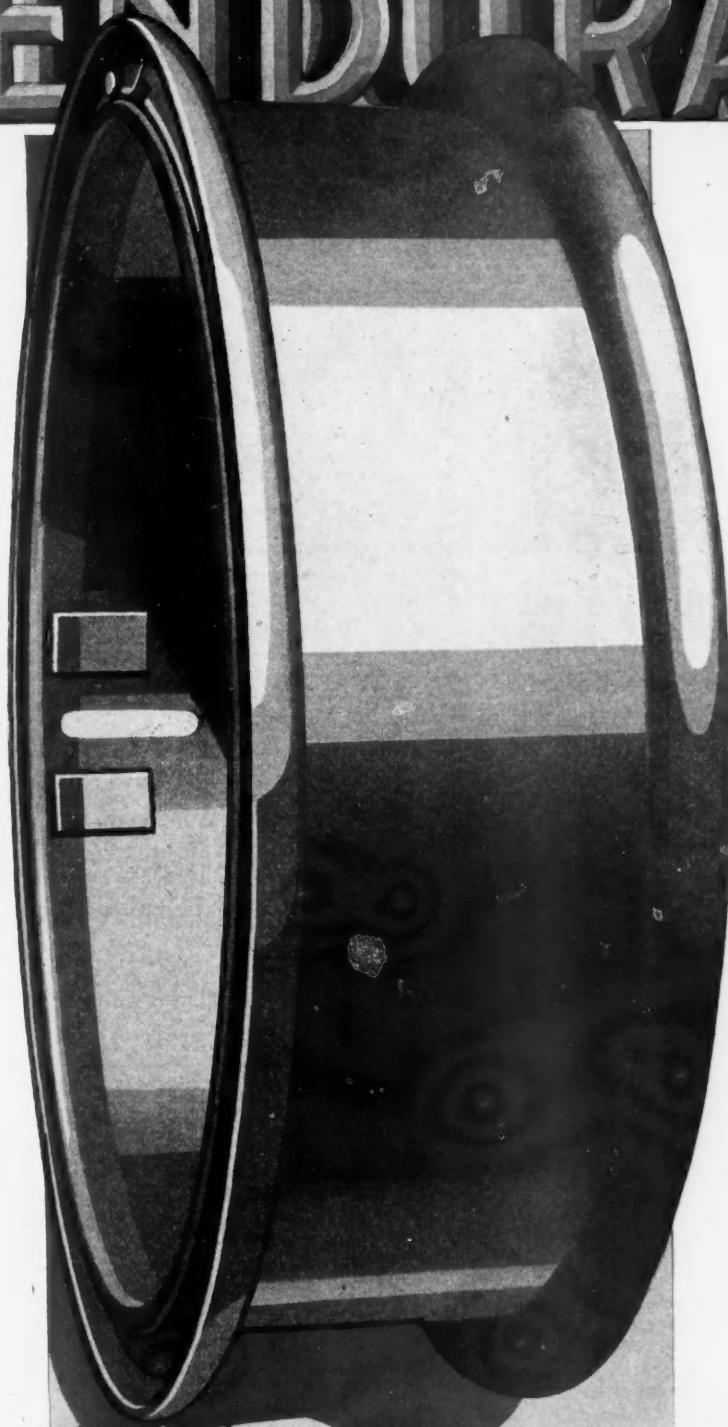
OHIO

**PARISH**  
FRAMES and  
STAMPINGS

**PARISH PRESSED STEEL CO.**  
READING PENNA.

*The Commercial Car Journal*

# ENDURANCE



WHEREVER trucks haul heavy loads, you will find Firestone Rims—doing their share on the wheels of progress, and doing it well. Firestone Rims are at the very foundation of the industry just as the Firestone Steel Products have been a dominant factor in the rim industry since its formation.

## THE FIRESTONE STEEL PRODUCTS COMPANY

Firestone Park • Akron, Ohio

# Firestone continuous base RIMS

FOR ALL TYPES OF WHEELS: WOOD - WIRE - STEEL - CAST



Out of a glorious past into a more glorious future, Air Brakes by Bendix-Westinghouse come to

you a time tested product—a recognized safety standard of the world. Backed by the two greatest

names in braking . . . The result of the same ceaseless engineering development and craftsman-

ship that has placed rail transportation on its present high plane of safety . . . Bendix-Westinghouse

Automotive Air Brakes have, through their own merit, become as necessary as dependable motive

power in the efficient operation of the modern heavy duty highway transport vehicle. Inquiries with

reference to any phase of power brake control are welcomed by the BENDIX-WESTINGHOUSE

AUTOMOTIVE AIR BRAKE COMPANY at Pittsburgh, Penna.

*This sturdy, compact Bendix-Westinghouse compressor not only furnishes an abundant air supply for all braking purposes but also makes available a never-failing power source for the operation of door control equipment, air horns and other pneumatic devices of the modern motor transport vehicle.*

6283

**BENDIX**  
**WESTINGHOUSE**  
AUTOMOTIVE AIR BRAKES



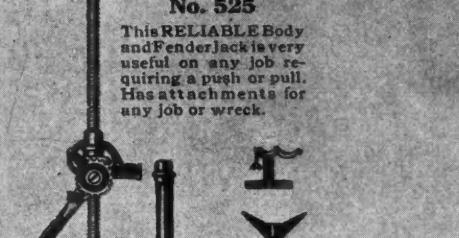
# It's Easy to Do RELIABLE Work with RELIABLE Tools!



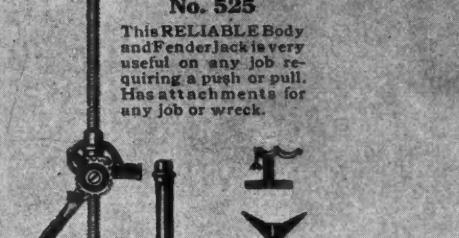
**No. 375**  
A sturdy, double lift truck jack. Built with two-speed gear. 4 foot handle makes operation easy and speedy.



**No. 85**  
An ideal "curb jack" for general service work. Short stroke makes it adaptable to all cars. Capacity 1-ton. Has automatic saddle feature.



**No. 84**  
A powerful "curb jack" of 1-ton capacity. Has exceptional range. Wheels make for very easy handling.



**No. 525**  
This RELIABLE Body and Fender Jack is very useful on any job requiring a push or pull. Has attachments for any job or wreck.



**No. 50**  
This Heavy Duty RELIABLE Hydraulic Jack for general service use has a capacity of 2½ tons and a 10 inch raise.



**No. 86**  
The No. 86 is an efficient, low priced roller jack for use around the garage.

THE SPEED with which you can do good tire, body and fender repair work depends upon the kind of tools you use. RELIABLE Jacks have been manufactured for over 25 years and are the choice of garage men everywhere. There is a size and kind for every possible need.

We manufacture a complete line of service station equipment including body and fender tools, tire repair machine, chain hoists, I-beam trolley, sling chains, wrecking cranes, etc., and are sole agents for the famous So Lo Jacks.

Write for large, illustrated catalogue.

MAKE SURE it's a RELIABLE—LOOK for the TRADE MARK

## RELIABLE BALLOON TIRE JACKS

"Everything that the Name Implies"

ELITE MANUFACTURING COMPANY  
110 Ohio Street

Ashland, Ohio

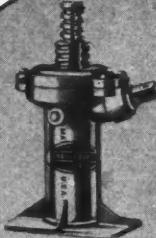
Northwestern Branch: G. A. ASHTON CO., 1547 University Ave., St. Paul, Minn.  
(Complete stock carried in Ashton Bldg.)

Southwestern Branch: THE CARROLL CO., 1323 Wall Street, Dallas, Texas  
(Complete stock carried in Carroll Warehouse)

Sales Representatives: RUBEN-MOSS CO., 17 West 60th St. New York, N. Y.;  
A. E. MOHRIG, 1454 Pine St., San Francisco, Cal.; McEWEN-CHERY  
CO., 1110 Nashville Trust Bldg., Nashville, Tenn.; ALLIS-HUBLEY  
CO., 328 Massachusetts Ave., Cambridge, Mass.;  
WINKENWEDER & LADD,  
1475 South Michigan Ave.  
Chicago, Ill.

**No. 95**

An adjustable repair stand of unusual utility. Has no springs. Dog is gravity controlled.



**No. 7**

Illustration shows the powerful No. 7, with 10-inch lift and 2 ton capacity



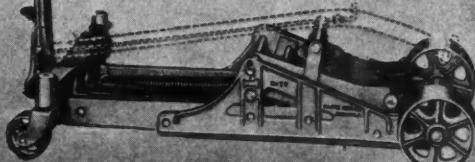
**No. 37**

This popular jack has a low starting height and large raise. An ideal jack for trucks with 30 x 5 tires and larger.



**No. 70**

The larger No. 70 for trucks has a 7-ton capacity and a 10 inch raise with safety device to prevent overloading.



# AMERICAN BRAKEBLOKS

# ...used by All Five Winners of this award.

What are the best maintenance methods employed by the nation's bus operators? To find out for the benefit of the entire industry, the publishers of a leading automotive magazine each year conducts a nation-wide contest. This year, five companies won prizes. Each reported an enviable record of brake performance, AND THE USE OF AMERICAN BRAKEBLOKS!

The first place winner in Group A, the United Electric Railway, Providence, R. I., uses American Brakebloks EXCLUSIVELY. This company owns 519 cars and 129 buses, maintains four garages, and operates between four and five million bus miles annually. During the three-month period of the contest, they had only 24 pull-ins from brake trouble as opposed to 170 pull-ins during the same period of 1929. This is a saving of more than 85 per cent! —a saving made possible by American Brakebloks and better maintenance methods.

The records of the other four winners also reflect the superiority of American Brakebloks. They prove conclusively that this new and different brake material cuts the cost per stop!

Why not give your fleet this same brake efficiency! Adopt American Brakebloks — the material that will not burn, soften, swell or wedge — the material that lasts longer and eliminates many brake adjustments. Write today for booklet, "Braking Facts," and name of nearest jobber.



Keeper-type American Brakebloks for heavy duty buses and trucks — the type used by the prize winners in setting their brake performance records.

#### AMERICAN BRAKE MATERIALS CORPORATION

Industrial and Automotive Division American  
Brake Shoe & Foundry Co.

4660 Merritt Avenue Detroit, Michigan, U. S. A.  
Sales Offices: Chicago New York San Francisco  
Export Department: 30 Water Street New York City



These records made with  
American Brakebloks  
—Not just "Brake Blocks"

These remarkable brake performance records would not be possible were it not for a new type of brake material, American Brakebloks, and a new type of brake shoes specially designed to take these Keeper Type Brakebloks. Both were created by the American Brake Materials Corporation.

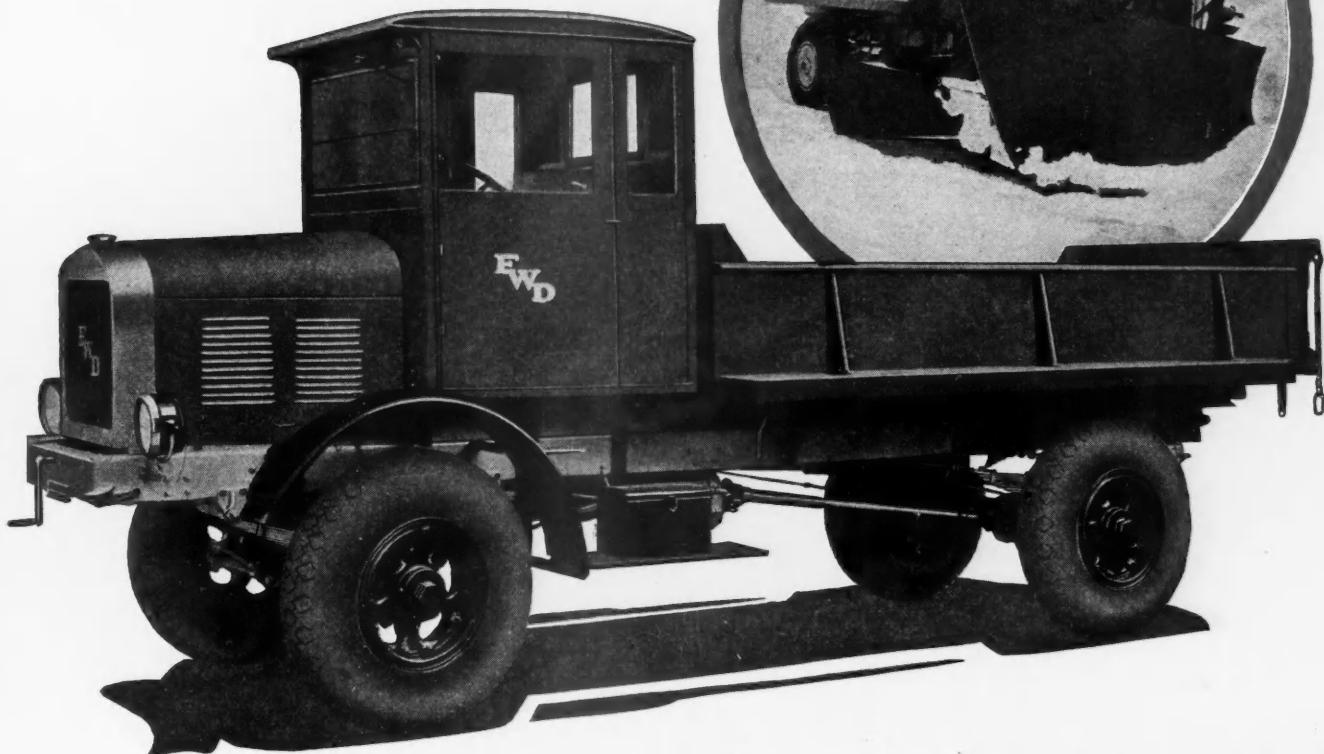
If you want this kind of brake performance, be sure you get the original AMERICAN BRAKEBLOKS, spelled B-R-A-K-E-B-L-O-K-S. Beware of any such confusing names as "Brake Blocks" and other terms coined to "cash-in" on the growing popularity of this different material.

#### The Winners!

First Prize (A) United Electric Railway, Providence, Rhode Island.  
Second Prize (A) Community Traction Co., Toledo, Ohio.  
First Prize (B) Blue Ridge Transportation Co., Hagerstown, Maryland.  
Second Prize (B) Washington Rapid Transit Co., Washington, D. C.  
First Prize (C) Grotton & Stonington Traction Co., New London, Conn.  
Second Prize (C) None awarded in this Group.

## NEW.. DIFFERENT.. BETTER

# PLENTY OF TRACTION



Drives through front and rear wheels, brakes on all four wheels.

Steers as easily as a pleasure car.

A general service truck which adapts itself to special needs and provides more than economical transportation.

Furnished in 2 to 10 ton sizes, including four wheel, six wheel and tractor trucks.

Manufactured by the oldest and largest manufacturer of four wheel drive trucks in the world.

Have increased in sales 1084% in the past eight years.

Received 62% of 1929 orders from owners of FWD trucks.

Over 1000 used by state highway departments alone in snow removal work.

## Every Wheel a WORKER!

DEALERS handling FWD Trucks sell to numerous fields . . . They are able to sell the heavy-duty markets . . . Consequently they do a big, profitable repeat business. In fact 62% of FWD orders come from FWD owners. This is because FWD Trucks are more economically adaptable to severest kinds of work.

Think of it—FWD Trucks drive and brake on all four

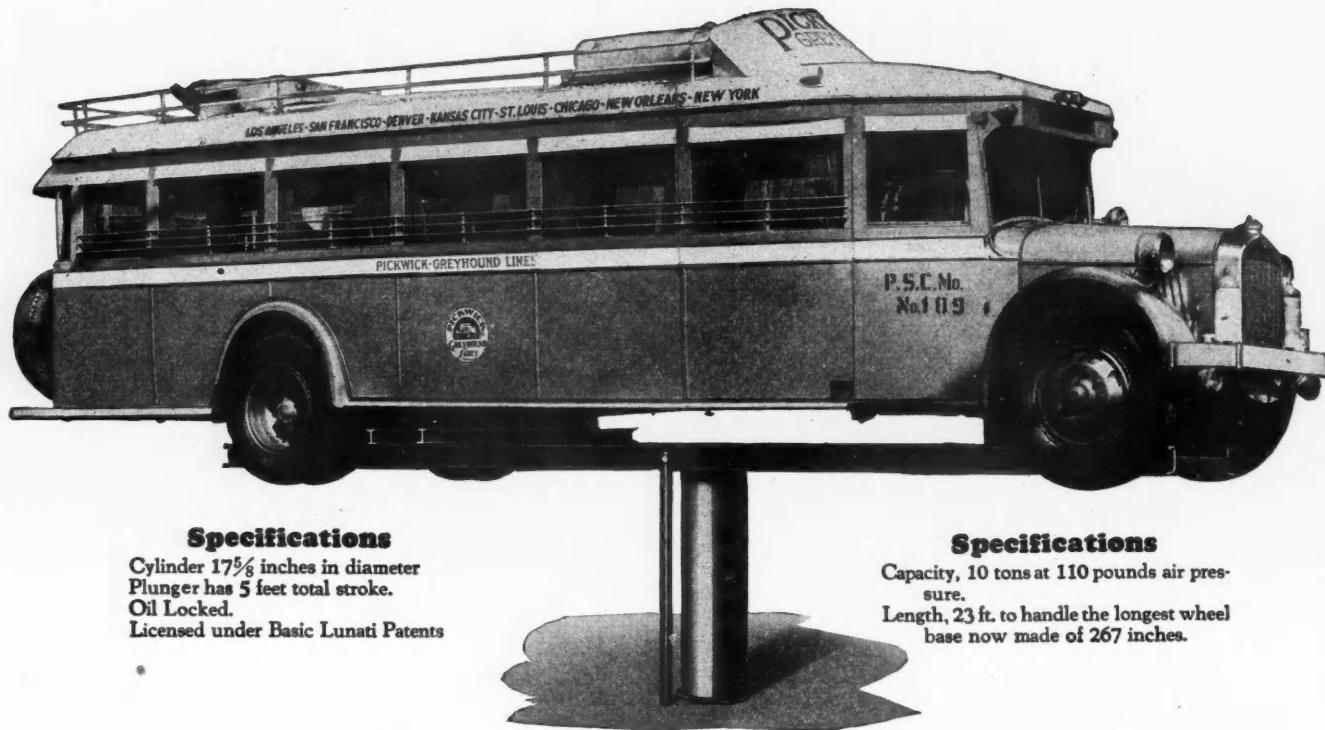
wheels . . . they have the ability to haul material wherever it is needed, regardless of road conditions. That's why you can sell to the highway field for road maintenance and construction, heavy hauling, oil field, lumbering and many others.

The line of FWD Trucks give all-year, all-purpose service . . . Let us give you full dealer particulars. Send for literature.

THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wis.  
CANADIAN FACTORY—KITCHENER, ONTARIO

**F  
W  
D  
TRUCKS**

# New CURTIS-built TRUCK and BUS Lift!



## Specifications

Cylinder 17 $\frac{5}{8}$  inches in diameter  
Plunger has 5 feet total stroke.  
Oil Locked.  
Licensed under Basic Lunati Patents

## Specifications

Capacity, 10 tons at 110 pounds air pressure.  
Length, 23 ft. to handle the longest wheel base now made of 267 inches.

WITH a lifting capacity of 20,000 pounds, and a platform length of 23 feet, this new Curtis Truck and Bus Lift will handle the heaviest and longest trucks or single-deck buses made.

It lifts the vehicle by front and rear axles, leaving the wheels hanging free for easy brake and wheel adjustments.

The Curtis Bus Lift is of a single-cylinder post type. It can be rotated to a full 360 degrees, which permits the vehicle to be driven forward both going on and off the lift. Installation cost is less and uniformity of lifting and lowering speed is assured.

The Curtis Truck and Bus Lift provides complete certainty of safety through:

**1. Tremendous structural strength** — 400 to 500% safety factor provided in all parts. The plunger itself is 17 $\frac{5}{8}$ " in diameter.

Mail this coupon to

**Curtis Pneumatic Machinery Company**  
1929 Kienlen Ave., St. Louis—518-H Hudson Term., N.Y.

Please send data sheet and information about the new Curtis Truck and Bus Lift.

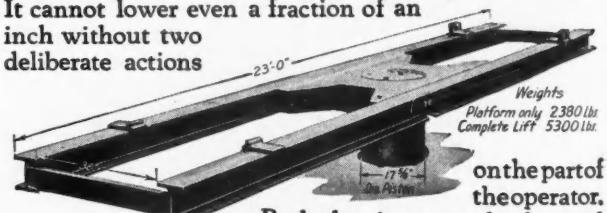
Name \_\_\_\_\_

Address \_\_\_\_\_

F1

**2. The electrically welded platform** is made of tremendously strong H-beams, capable of standing five times the weight called for by lift's capacity.

**3. All oil, no air in the cylinder.** Being both lifted and locked by incompressible oil, at any height you stop the lift it is as solid as if on concrete. It cannot lower even a fraction of an inch without two deliberate actions



on the part of the operator. Both the air operated valve and oil lock valve must be opened before lowering can start and neither of these controls are under the lift. The Curtis Lift is super-safe.

**4. A safety retard valve** automatically and positively governs the lowering speed.

**5. A safety leg** furnished without extra cost is an extra safety feature.

**6. Elimination of fire hazard** from heavy gasoline fumes in pits.

Complete details of this new Curtis Truck and Bus Lift are given on an illustrated data sheet now ready. Mail the coupon for it and ask for any other special information you would like to have.



# WORN ENGINES BECOME LIKE NEW

*Accuralite*

**CHROME-NICKEL**

TRADE MARK

**CYLINDER  
SLEEVES**

*Also Manufacturers of*

*Accuralite* CAST-IRON PISTONS  
LYNITE-PISTONS  
PISTON PINS

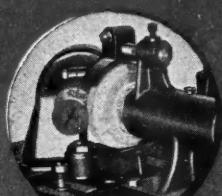
**W**HEN the cylinder block has reached the reborning or regrinding limit, don't scrap it. Fit it with a set of CHROME-NICKEL Cylinder Sleeves and it becomes like new.

Unlike ordinary iron sleeves, CHROME-NICKEL sleeves are absolutely free from sand holes and hard spots. The wall thickness is of perfect uniformity. CHROME-NICKEL has seven times the wearing qualities of iron sleeves. Special heat treatment removes all casting strain. Each sleeve is precisely machined and guaranteed both as to fit and perfection.

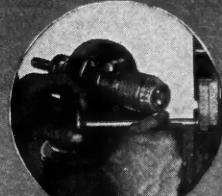
If you do not have the facilities for installing a set of CHROME-NICKEL sleeves an Accuralite Wholesaler will do it for you in his service shop. The cost is moderate, effecting considerable saving over the purchase and installation of a new block. Make the old engine like new by replacing worn, cracked or scored cylinders with long-wearing CHROME-NICKEL Cylinder Sleeves. For sizes and prices write

**The**  
**ACCURALITE COMPANY**  
Muskegon, Michigan

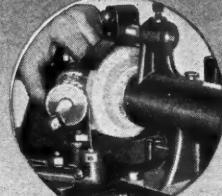
# VALVE FACE GRINDING MACHINE



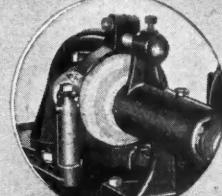
Refacing Valve



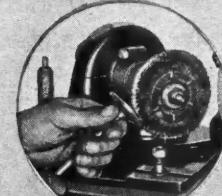
Truing Valve Stem End



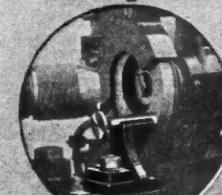
Sharpening Reamer



Dressing Emery Wheel



Cleaning Valve



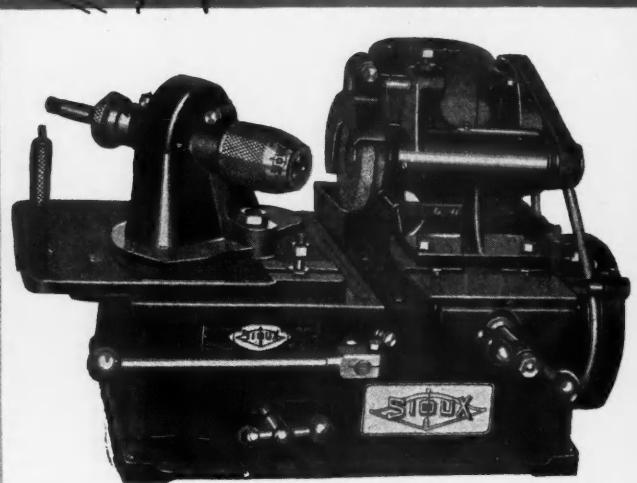
Grinding Tappet



Grinding Rocker Arm



with the  
Sioux  
Roller  
Chuckinq  
System



No. 650 has chucking capacity of 5/16 to 5/8 inch diameter inclusive. Grinds valves of any angle . . . . . Net \$160



This . . .  
**ONE Machine**  
**does MANY Jobs**  
*easier-quicker-better* **STANDARD THE WORLD OVER**

WITHOUT extra equipment, it refaces valves, trues and chamfers valve stem ends, sharpens reamers and dresses its own emery wheel.

In addition, extra attachments are available, at nominal cost, for performing the following operations:

- No. 896. V-Bracket for grinding tappets . . . Net \$ 1.00
- No. 674. For grinding rocker arms . . . . . Net 7.00
- No. 670. Brush for cleaning carbon from valves . Net 3.75
- No. 890. For grinding Ford "A" valve stem ends Net 15.00
- No. 680. For sharpening expansion reamers . . Net 50.00

All of these jobs are done by the "Sioux" with precision accuracy that measures up to factory standards . . . giving the motorist results that delight him with his car's performance. Remember, only the "SIOUX" Valve Face Grinding Machine is backed by the famous Sioux Guarantee. Made in four models . . . Nos. 610, 620, 650 and 660 . . to fit the requirements of different shops.

**Your Jobber Sells Them**

ALBERTSON & CO. INC., Sioux City, Iowa, U. S. A.

CARE  
WILL SAVE  
YOUR CAR



A GOOD ACTION PICTURE OF THE WORLD'S FASTEST DUMP TRUCK HOIST!!!

YOU CAN ALWAYS "SPOT" A HEIL HOIST BY THE TWO GLISTENING STEEL  
 PISTONS PUSHING DIRECTLY AGAINST THE BODY TO DUMP THE LOAD  
 IN RECORD TIME, REGARDLESS OF THE TWIST OF THE TRUCK CHASSIS  
 FRAME - - - SEND TODAY FOR YOUR COPY OF THE NEW HEIL EQUIPMENT  
 MANUAL COVERING HOISTS, BODIES AND TANKS FOR MOTOR TRUCKS

# THE HEIL co.

MILWAUKEE

CHICAGO

DETROIT

BRANCHES:  
 NEW YORK  
 35 DISTRIBUTORS

WISCONSIN

PHILADELPHIA

BOSTON



Dependable materials  
are the best assurance of  
dependable performance

One of 14 Moreland 6-wheel  
trucks used at United Verde  
Copper mine.

Below: Heavy duty truck axle  
housing cast from electric fur-  
nace Nickel Alloy Steel mfd. by  
MORELAND MOTO  
TRUCKCO., Los Angeles, Cal.



## MORELAND TRUCKS . . . with Nickel Alloy Steel parts . . . stand the gaff of hardest service

THE Moreland heavy duty truck is built to withstand the arduous service of Pacific Coast mining and lumbering operations. Naturally, only the highest grade steels are employed.

Axle housings are cast of Nickel Steel from the company's own electric furnaces. Used in the annealed or normalized condition, a uniformly tough and dependable product is secured. In addition, Moreland trucks are equipped with Hercules or Continental mo-

tors, both of which contain important Nickel Steel parts. Timken axles, with shafts of Nickel Chrome Steel, and Brown-Lipe transmissions, with both gears and shafts of 3½% Nickel Steel also are used.

The motor truck industry in particular, as well as the automotive field in general, have profited greatly by the demonstrated high qualities of Nickel Alloy Steels. Our

engineers will gladly advise you concerning the proper type of Nickel Steel for your specific problems.

**Nickel**  
FOR ALLOY STEEL

SEND FOR LIST OF AVAILABLE PUBLICATIONS ON NICKEL AND ITS ALLOYS

 THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y. 



## SOMETIMES WE ARE THANKFUL WE CAN "TALK TURKEY"

### Voltage Regulation Minimizes Electric Maintenance

- 1 Battery cannot be overcharged.
- 2 The battery is charged only at the correct rate for its state of charge.
- 3 Battery will operate longer without requiring replenishing of electrolyte.
- 4 Life of battery greatly prolonged.
- 5 Lights can be operated direct from generator.
- 6 Loose connections will not cause lamp bulbs to burn out.
- 7 Makes most economical generator system.
- 8 Any Leece-Neville Voltage Regulated Generator can be used without battery.
- 9 Lamp life greatly prolonged.
- 10 Motor coaches fitted with Leece-Neville voltage regulated generators provide passengers with satisfactory illumination and safe transportation.

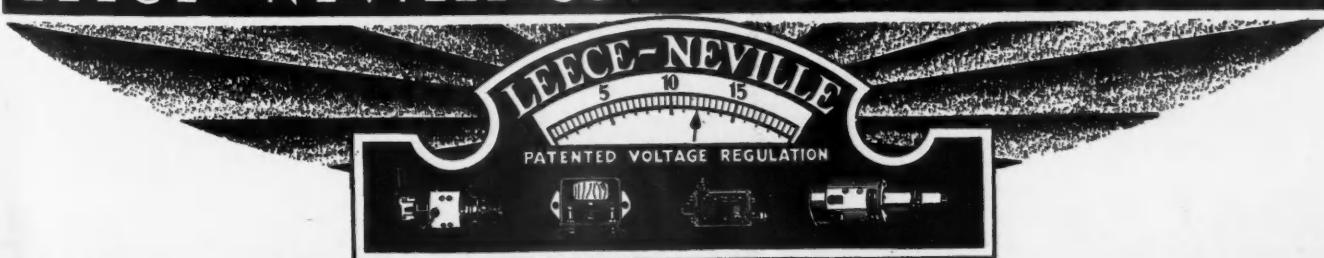
For several months we have expressed the wish for a novelty or a gadget on which we could build a tricky sales appeal. But when we see some of these ill-fated cure-alls come home to roost we're thankful for our practical necessity and the few honest, straightforward statements we can make for it.

That's all we have, a practical necessity to keep batteries constantly in good condition, preventing costly tie-ups and dissatisfied customers.

All we can do is keep plugging away at our story, month after month, year in and year out.

*The Leece-Neville Voltage Regulator is a good product. It keeps your batteries constantly in good condition.* There are satisfied Leece-Neville users in your territory and we can prove it at the same time you ask us to prove our story on Voltage Regulation.

LEECE-NEVILLE CO. — CLEVELAND, OHIO



# Never before has a 2-ton truck been sold at this *low price* **\$895**

AT THE FACTORY

... nor has a seventy (70) horsepower engine ever before been available in a truck of such low price.

THE great surplus six-cylinder power of Studebaker trucks—heavy duty frame—Timken full-floating rear axle—four speed transmission—dual rear wheels—four wheel brakes, and other quality features combine to yield low operating expense. Loads, roads and speeds which put other trucks in the shop leave these sturdy, powerful Studebakers fresh and ready for more. They are built to be worthy of the Studebaker name and of 78 years of Studebaker quality traditions.

#### 1-½ TON

130" chassis .... \$695  
160" chassis .... \$775  
Dual rear wheels and auxiliary springs optional at extra cost.

#### BODIES

Cabs and all Standard bodies available with both 1-½ and 2 ton chassis including panel, screen, express, stake, canopy, grain, cattle bodies.

#### 2 TON

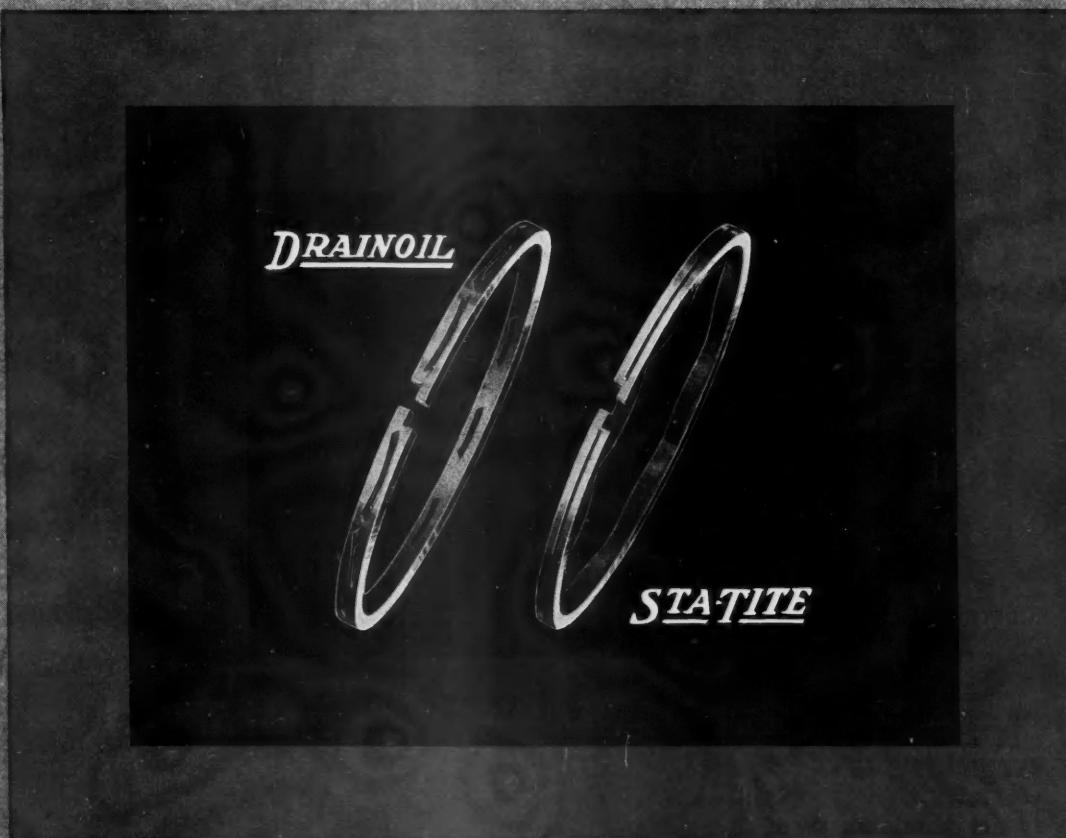
148" chassis .... \$895  
160" chassis .... \$945  
Dual rear wheels standard  
Auxiliary springs optional at extra cost.

All prices at the factory

Some territory is still open. If interested in the franchise for these Studebaker trucks or the Pierce-Arrow trucks which are to come, write

S. P. A. TRUCK CORPORATION, South Bend, Indiana

# STUDEBAKER Trucks



# QUALITY

---

## BRAND PISTON RINGS

The DRAINOIL with Single or Double Slots gives positive oil control plus positive lubrication. The oil slots in this ring are upslanting (an exclusive, patented feature.) On the down stroke the surplus oil is collected from cylinder wall and returned to the crankcase to again be put in circulation.

STA-TITE RINGS are for tapered and out-of-round cylinders and will "Restore That Youthful Performance". The inner spring is entirely different. Write for complete information.

More QUALITY BRAND rings are used for original equipment and replacements than any other make.

THE PISTON RING COMPANY

Muskegon

Michigan



# NEW DUMPING UNITS

## For 1 & 1½ TON CHASSIS

***Lower in Price***  
***Stronger Construction***  
***New Design***  
***Finer Appearance***

Bodies are ruggedly built of 10-gauge, high resistant steel, electrically welded.

Sides are flanged. No bulging or bending. Coal bodies have flared sides.

Tailgate strongly reinforced. Swings up or down. Adjustable. Lowers flush with body floor.

Tailgate presses against end of body sheet, making tight-fitting joint when closed.

Tailgate posts rigidly built from one-piece pressed steel, turned in and welded to body sides as a brace.

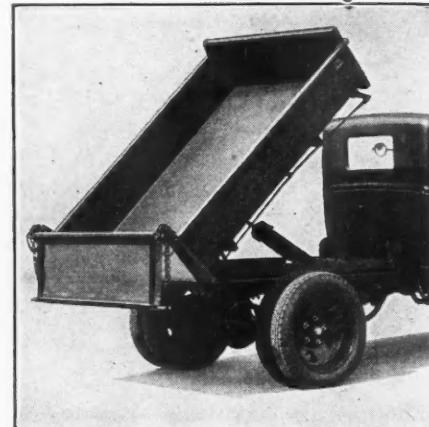
Body subframe built of two 4-inch channel longitudinals and five 3-inch channel cross-members.

*Send for complete information on this great line  
of Wood hoists and bodies for light chassis.*

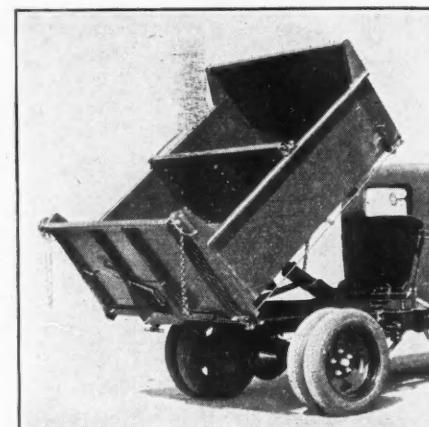
WOOD HYDRAULIC HOIST & BODY CO.  
DETROIT, MICHIGAN, U. S. A.

**WOOD**  
HOISTS & BODIES  
BRANCHES AND DISTRIBUTORS IN PRINCIPAL CITIES

November, 1930



Type C4 body is well designed and strongly built. Ideal for hauling and dumping sand, gravel, dirt and general materials. Illustrated here with the Wood Model AP hydraulic hoist.



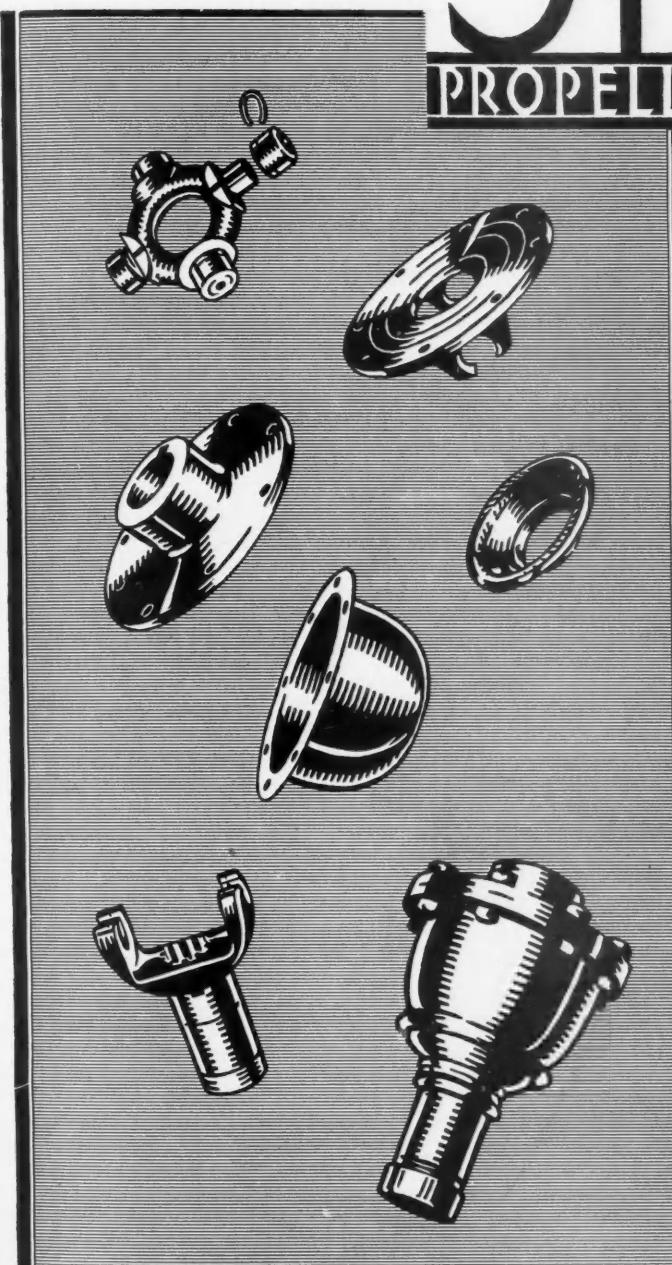
Type C4, 75 cu. ft. coal body, a real combination job, handles 2 tons of coal without sideboards. Front and rear ends are built 120 cubic feet capacity. With sideboards, 2 tons of coke can be carried. Equipped with one swinging steel partition. Coal door and chute in tail gate. Shown above with Wood Model A hand hoist.



Type C12 body is designed for heavy duty service. Full length running boards and steel side braces stiffen the sides. Ideal for steam shovel work and handling unusually heavy material. Shown with Wood Model G1 hydraulic hoist.

*The Commercial Car Journal*

GENUINE  
**SPICER**  
 PROPELLER SHAFT PARTS



To keep ton mile costs down replace with Genuine Spicer Joints and Parts. They restore propeller shaft to original performance standards.



ASSOCIATED **Spicer** COMPANIES

**BROWN-LIPE**  
 CLUTCHES and  
 TRANSMISSIONS

**BROWN-LIPE GEAR CO.**  
 SYRACUSE NEW YORK

*The Commercial Car Journal*

**SALISBURY**  
 FRONT and REAR  
 AXLES

**SPICER MFG. CORP.**  
 TOLEDO

**SPICER**  
 UNIVERSAL  
 JOINTS

OHIO.

**PARISH**  
 FRAMES and  
 STAMPINGS

**PARISH PRESSD STEEL CO.**  
 READING PENNA.

*November, 1930*

# Here's Autocar Leading the Field again . . .

Business is making new demands on the motor truck industry. The warehouseman, the coal dealer, the freight hauler, the food distributor have all demanded better motor trucks. The Autocar Company has provided them. » » » Now the building supply dealers want a new type of truck. They want to supply transit-mixed concrete. There's money in it—if they can haul it economically. They want a truck with a frame as strong as a steel bridge, an engine as reliable as a jeweled watch. They want power. They want long life. Most of all, they want a truck that doesn't eat up all the profits. » » » They're getting what they want in the new Model C Autocars. A 3½-5 ton chassis, powered with the 101 h. p. Autocar Blue Streak 6-cylinder engine. A 9-inch channel steel frame. A wheelbase of 186 inches with power take-off from the transmission. The Autocar double-reduction rear axle. A speed of 48.1 miles per hour under full load. And an economy of operation beyond their fondest hopes. » » » Autocar is leading the field again.

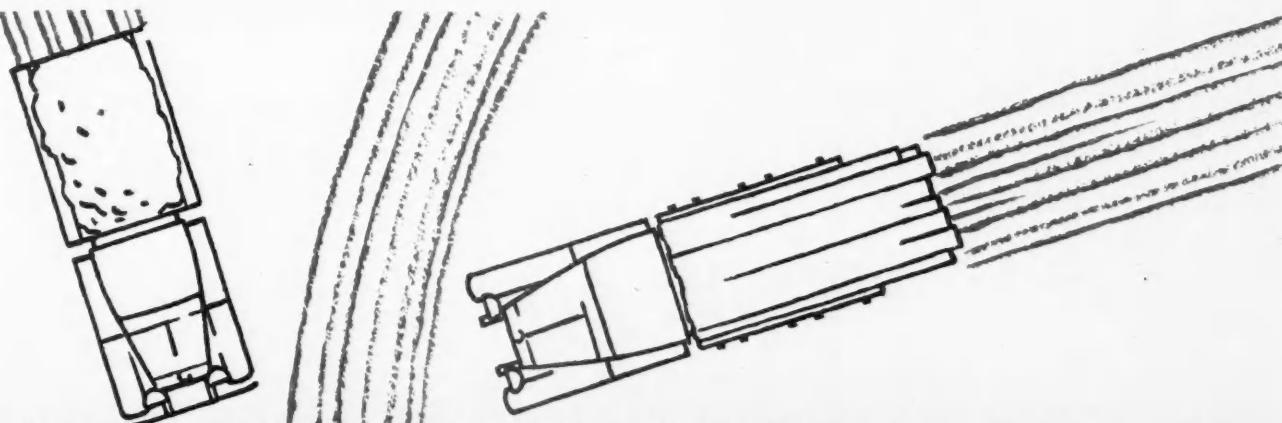


William H. Brant of West View, near Pittsburgh, Pa., owns this modern Autocar, designed and built especially to handle the heavy, rotating load of its transit-mixing body. He is one of a host of building materials dealers who are turning to Autocars for this type of work.



## AUTOCAR TRUCKS

THE AUTOCAR COMPANY, ARDMORE, PA.



# TRUCKS GO AIR ON AIR

...and there's *one*  
**best wheel for a**  
**speeding truck!**

#### Dayton Brake Drums

are superior in Strength and Wearing Qualities. The metal, made by a special process in electric furnaces, has an even distribution of small, uniform grains of graphitic carbon. Dayton Brake Drums last longer, stay smooth, and save brake linings.

Safe, Profitable Speed for your trucks over the long haul is possible only with the best possible equipment. A speeding truck must have a good wheel. A wheel that will endure the increased revolutions, the heavier loads and the harder knocks without bending, slipping or getting out of true alignment. Such a wheel is the Dayton Dual Pneumatic.

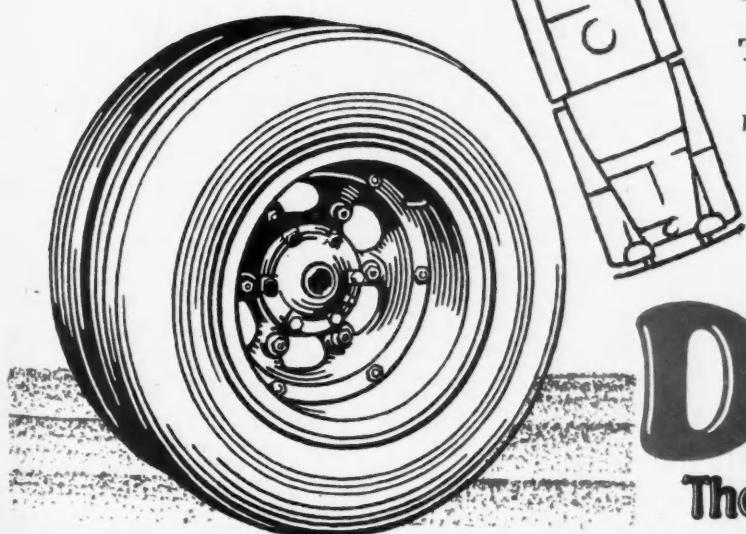
The first cost of a set of Dayton Duals is the last and only cost. They never require servicing. No extra wheel is necessary. Only a rim and tire are needed as a spare. You can change from one tire size to another without changing wheels, and one tire is interchangeable all around.

And Dayton Duals are remarkably easy on tires. Truck and tire manufacturers have tested them and have found that they are the coolest running wheels—tires run cool and give greater mileage.

Dayton changeover service is complete and convenient. Distributors in principal cities throughout the country will give you quick service. Specify Dayton, on your new trucks.

**The Dayton Steel Foundry Company**  
Dayton, Ohio

*We have acquired the Tigerloy Brake Drum Division  
of the Massillon Steel Castings Company  
of Massillon, Ohio.*



# Dayton

**The Mark of a Good Wheel**

Nothing *Finer*  
Can Be Said of Any  
Motor Vehicle Than,  
It is-

POWERED  
BY  
LYCOMING

LYCOMING MOTORS

LYCOMING MANUFACTURING CO.  
WILLIAMSPORT, PENNSYLVANIA

*Lycoming's Vast Resources, Experience and Skill Are Dedicated to Leadership in Fine Motor Building*  
November, 1930

*The Commercial Car Journal*

# 77% REPEAT SALES

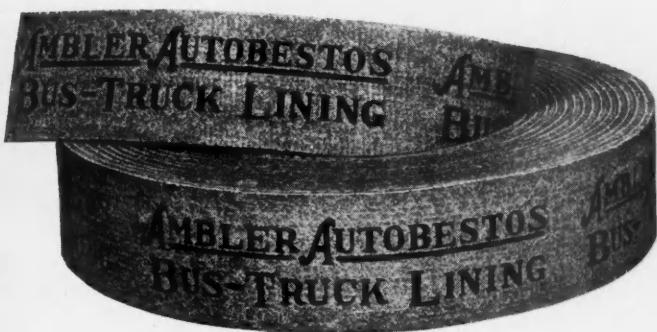
77% of Ambler Autobestos Bus-Truck Lining sales have been made to Bus and Truck Companies who have renewed their purchase agreements. Some of these accounts extend over periods of three or more years.

Such confidence just doesn't happen. It is unquestionably based on the performance of Ambler Autobestos Bus-Truck for Bus-Truck is not a price lining. It's a lining engineered for the heavy duty field. Consequently, when properly applied, it lives up to the performance standard and length of service claimed for it.

If you buy on performance, you'll at least give Ambler Autobestos a trial. Four great linings meet every condition of service and are applicable to every type brake. Keasbey & Mattison Wholesalers are equipped with data to apply the proper lining to your service requirements. We'll gladly recommend a wholesaler to you.

KEASBEY & MATTISON COMPANY,

*Ambler Pennsylvania*



**AMBLER AUTOBESTOS**

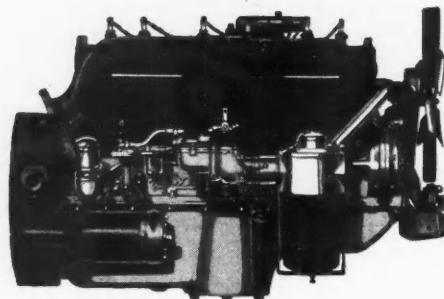
BLUE BRAND

**Bus - Truck Lining**

# Hercules Engines Help Operators Win Bus Maintenance Awards



In a field where operating conditions are exacting—where routine servicing pays dividends—Hercules Engines have effected many economies. Out of five possible awards in Bus Transportation's "progress in maintenance" competition, three were won by operators of bus fleets exclusively or partially Twin Coach—powered by Hercules Engines built to Twin Coach specifications. Many leading manufacturers of commercial cars and trucks have also recognized Hercules' superiority in the field of heavy-duty power—have adopted Hercules Engines as standard equipment.



**HERCULES MOTORS CORPORATION, CANTON, OHIO, U. S. A.**

New York Office: New York, N. Y.

Mid-Continent Office: Tulsa, Okla.

West Coast Office: San Francisco, Cal.

Distributors: Smith-Booth-Usher Co., Los Angeles, Cal.; Edward R. Bacon, San Francisco, Cal.; F. C. Richmond Machinery Co., Salt Lake City, Utah; Worthington Machinery Corp. of Oklahoma, Tulsa, Okla.; Norvell-Wilder Supply Co., Beaumont, Texas; Bovaird & Co., Bradford, Pa. European Distributor: Automotive Products Co., London, Berlin, Vienna.

# HERCULES ENGINES



# Champions

**CLEAR THE WAY FOR  
HEAVY DUTY WINTER BUSINESS**

Fleet owners must own and operate their own snow removal equipment. Particularly where snowfall is heavy on private roads, parkways, factory sites and on secondary roads not taken care of by state or county highway departments.



These fleet owners are invited to call on Snow Plow Headquarters or any of its distributor-branches, for help in selecting the best snow plow, adaptable to their problems and the amount of money they decide to invest. This selection can easily be made out of the oldest and most complete line of snow removal equipment—Champion Snow Plows.

**UNIVERSALLY ATTACHABLE  
TO ALL STANDARD TRUCKS**

*Branches at:*

Watertown, Mass. ....	36 Pleasant St.	Pittsburgh, Pa. ....	1941 Oliver Bldg.
Portland, Ore. ....	3rd and Hawthorne Sts.	New York, N. Y. ....	50 Church St.
Chicago, Ill. ....	1821 Builders' Bldg.	Albany, N. Y. ....	405 First Trust Bldg.
Philadelphia, Pa. ....	810 Commercial Trust Bldg.	Buffalo, N. Y. ....	733 Ellicott Square Bldg.
	Harrisburg, Pa. ....		Security Trust Bldg.

## The GOOD ROADS Machinery Co., Inc.

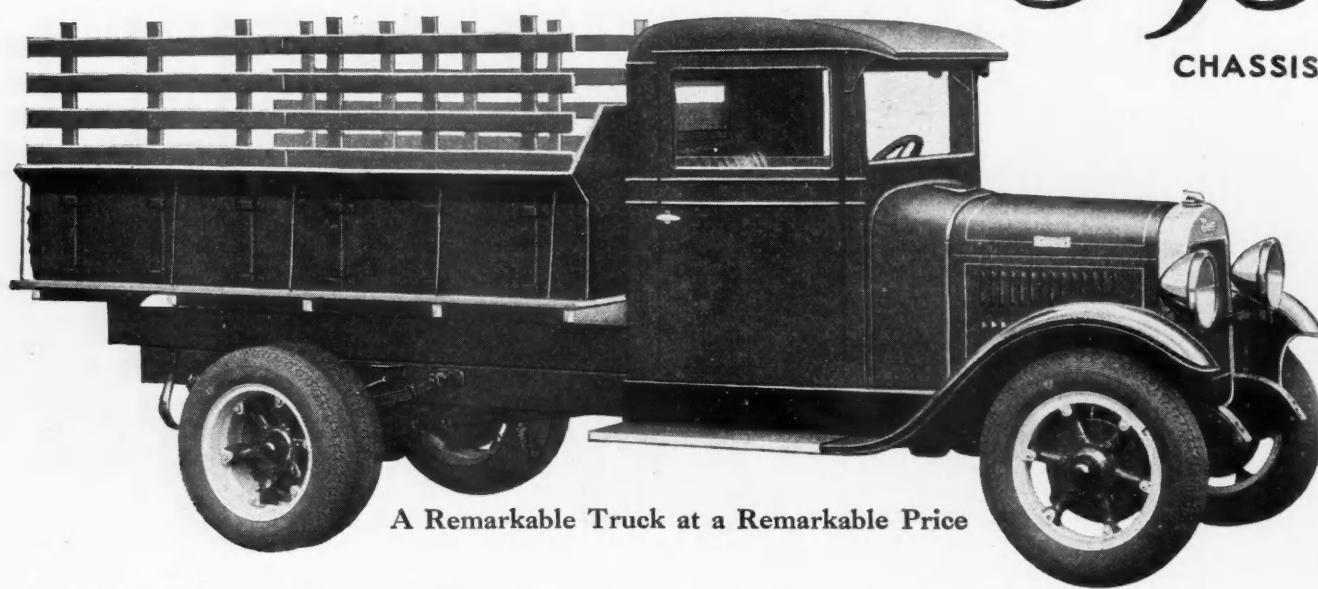
"Snow Plow Headquarters"

KENNETT SQUARE, PA.

# Stewart 1½ Ton Truck

\$895

CHASSIS



A Remarkable Truck at a Remarkable Price

## Dealers Are Making Large Profits Selling Stewart Trucks

The Stewart liberal dealer franchise offers both car and truck dealers an unusual money-making opportunity.

To car dealers, the Stewart franchise means a chance to greatly increase their profits with little or no advance in overhead. Truck sales are steady the year round. Trucks do not have the frequent style and model changes that beset the passenger car.

MODELS		
BEVEL AXLE		
1 ton 4 Cylinder	-	\$ 695
1 ton 6 Cylinder	-	795
1½ ton 4 Cylinder	-	895
1½ ton 6 Cylinder	-	995
1½ ton 6 Cylinder	-	1195
1¾ ton 6 Cylinder	-	1495
2 ton 6 Cylinder	-	1695
2½ ton 6 Cylinder	-	1990

**Stewart**  
MOTOR TRUCKS

STEWART MOTOR CORPORATION  
BUFFALO, N. Y.

Export Branch: 1 Broadway (Dept. 3)  
NEW YORK CITY, U.S.A.

Cables: Stewartruk New York.  
Codes: Acme, Bentley.

MODELS  
WORM AXLE

2 ton 6 Cylinder	-	\$2290
*2½ ton 6 Cylinder	-	2690
*3 ton 6 Cylinder	-	3290
*3½ ton 6 Cylinder	-	3690
*5 ton 6 Cylinder	-	4990
*6-7 ton 6 Cylinder	-	5700

\*Double Gear Reduction Axle  
Optional Equipment.

**Stewart Trucks have won—By costing less to run**

# When dependability means GOOD DELIVERY SERVICE



PROGRESSIVE merchants offer their communities in delivery service an added buying convenience that pays big dividends. To protect this merchandising asset, owners of delivery fleets naturally specify equipment whose performance they *know* to be dependable.

Many of these fleet owners agree on Willards for battery equipment—because they recognize the importance of battery dependability to a delivery fleet. And Willards are justifying this decided preference in fleet operation everywhere.

**Willard** STORAGE  
BATTERIES  
CLEVELAND, OHIO  
LOS ANGELES, CALIF. • TORONTO, ONT.

# MORE JACK FOR YOUR "JACK"

**S**IMPLICITY of design—low cost of manufacture—ease and speed of operation—strength and convenience of servicing are the outstanding features of Silver King Hydraulic Jacks which support our claim of "more jack for your 'Jack'."

A one piece certified malleable body—highest quality of materials throughout—liberal design and precision workmanship make it possible for us to guarantee every Silver King which leaves our factory.

Particularly designed for heavy duty commercial service. Every Silver King is tested at one and one-half times its rated capacity before shipment.

Our special introductory offer makes it easy for you to try out the Silver King and find out what real Jack satisfaction and economy mean.

## THE SILVER KING HYDRAULIC JACK CO.

5604 Cedar Ave. + Cleveland, Ohio

Gentlemen:—Please send complete information on Silver King Hydraulic Jacks and your special introductory offer.

Company \_\_\_\_\_

Address \_\_\_\_\_

Signed by \_\_\_\_\_  
Show your preferred Jobber in margin.



# THE SILVER KING

# new style colors DRIVER COMFORT

*and the Lowest Prices*  
 in REO history **\$895**  
 F.O.B. LANSING, MICH. *and up*



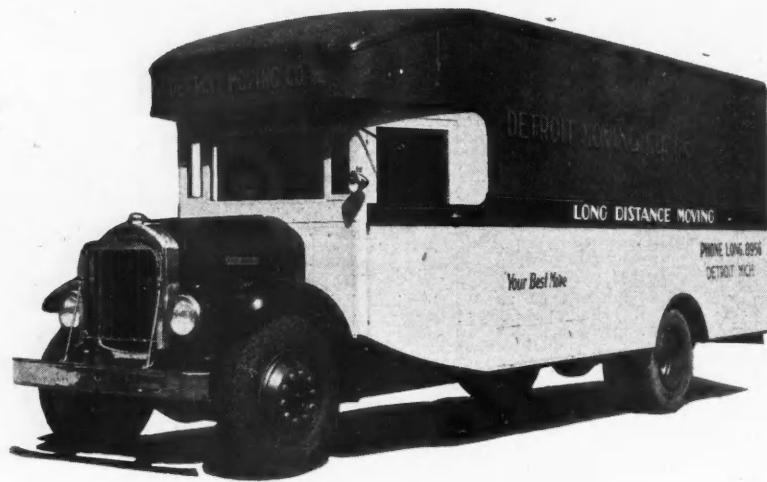
**REO** SPEED WAGONS  
AND TRUCKS

New chromium radiator with protecting bars . . . Heavier fenders . . . New lamps . . . Door ventilating latch . . . Safety glass in windshield . . . Heavier running boards . . . Heavier hood fasteners . . . 3-point cab suspension . . . Heavier door handles . . . New 1½ ton rear axle — 40% stronger, accommodates dual wheels . . . New 1½ ton 4-speed transmission with power take-off.

# Fisher-Standard

*"Built of the Best and Stand the Test"*

A COMPLETE  
LINE OF  
MOTOR  
TRUCKS  
BY A  
PIONEER  
BUILDER



NEW  
PROFITABLE  
FLOOR PLAN  
FOR  
DEALERS  
CAPACITIES  
3/4 TO 10 TONS

**STANDARD MOTOR TRUCK COMPANY**  
DETROIT, MICHIGAN, U. S. A.

## Old Hickory Kingham Trailers

and  
**Old Hickory**  
Winches are made  
**EXCLUSIVELY** by Us

Buy the genuine from the authorized manufacturers and be protected from any possibility of trouble. Send to us for repair parts and get the right thing at once. Over 50 years' experience—a 32 acre plant—prices always right. Distributors at all principal points. Write for dealer's "proposition."



KT-82 for Logging,  
Lumbering and Pipe  
Line Use

Flexibility—the flexible pole prevents torsion twist or strain on the roughest roads.  
Light weight:—alloy steel construction properly engineered. More pay load. Quick repair—over 75% of parts used can be replaced at your local service garage, balance in stock at our factory for immediate shipment. No lost profit from lay-ups.

**KENTUCKY WAGON MANUFACTURING CO., Inc.**  
LOUISVILLE KENTUCKY

# MR. KING IS THOROUGHLY SOLD...

MERRILL B. KING, PRESIDENT  
MANNY K. CREAMER, VICE PRESIDENT

**REX PAPER COMPANY**  
ORGANIZED 1916 BY JOHN F. KING  
MANUFACTURERS  
COATED AND OFFSET PAPERS  
KALAMAZOO, MICH.

HARRY C. BRADFORD, SECRETARY  
ROY V. MCCULLOR, TREASURER

Budd Wheel Company  
Detroit, Michigan

Gentlemen:

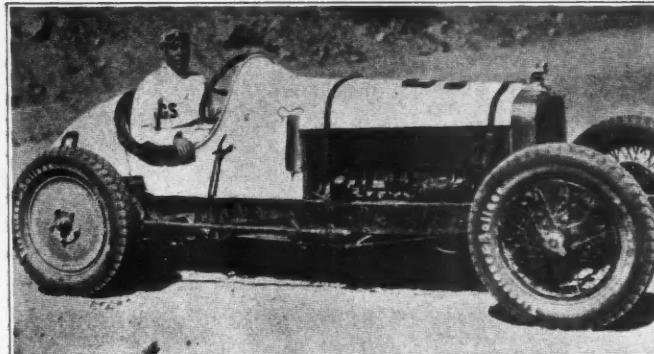
In further reference to your letter of the 17th  
our Federal trucks, we are more than pleased, which we have on  
that these same wheels which we wrote you about on November  
19th, 1927, are still in use and our records indicate we  
have had no expense in connection with them.

Attention Mr. J. H. Barnes  
and at this time are apparently in as good condition as ever.  
They have been and are in daily service  
and we are 100% for Budd equipment.

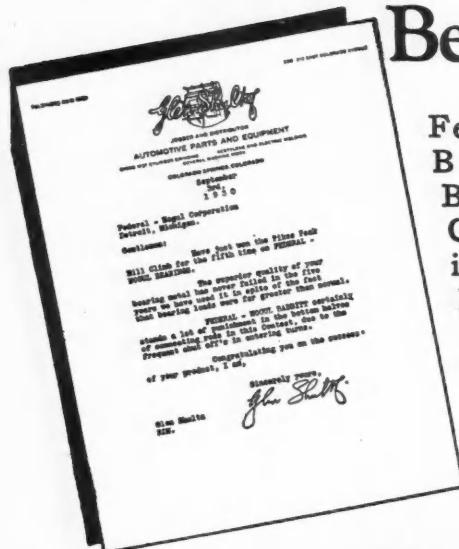
Very truly yours  
REX PAPER COMPANY  
*[Signature]*

M. B. King  
GHC

**BUDD DUALS**  
**BUDD WHEEL COMPANY, DETROIT**



## Pike's Peak Climb Won for 5th Time on Federal-Mogul Bearings!



Federal - Mogul  
Bronze Back  
Babbitt - Lined  
Crankshaft Bearings and Federal-  
Mogul Babbitt-  
Lined Connecting Rods were  
used on this car.

# Federal



Other Products in the Federal-  
Mogul Line are:

Laminum Shims  
Bronze Back, Babbitt-Lined  
and Die-Cast Connecting Rod and  
Main Bearings (Standard and  
Undersize), Piston Pin Bushings  
Connecting Rod Bolts and Nuts  
Bearing Anchor Screws  
Bronze Bars and Babbitt Metals  
Rebabbitting Connecting Rods  
Shoemaker Rebabbitting and  
Line Boring Equipment

Meet us at the  
N. S. P. A. and  
M. E. A. Joint Show,  
November 13 to 19,  
Cleveland, Ohio,  
Booths No. 355 to 360  
inclusive.



**FEDERAL-MOGUL CORPORATION**  
DETROIT, MICHIGAN

November, 1930

A Message

from

B. A. Gramm



Dean of the  
Motor Truck  
Industry

MR. B. A. GRAMM  
President and Treasurer  
Gramm Motors, Inc.,  
Delphos, Ohio

## A GOOD NAME

'Twas Shakespeare who wrote:

"He who steals my purse steals trash  
But he who robs me of my good name,  
Takes that which enricheth him not  
But leaves me poor indeed."

That is why I am proud of the name of Gramm for in all my thirty years experience in manufacturing motor trucks, the name of Gramm has been emblematic of fine truck equipment.

It has been my aim since 1900 to be faithful to the truck user. As a result, the Gramm nameplate on a truck is the greatest assurance to its owner of real dependability and low operating cost per ton mile.

**DON'T EXPERIMENT—  
BUY A GRAMM**

Each chassis admirably sustains the Gramm slogan:

**"POWERFUL AND FAST—BUILT TO LAST!"**

**GRAMM MOTORS, Inc.**

*Builders of fine Motor Trucks, Vans, Busses  
and Specialized Chassis for Fire Apparatus*

DELPHOS, OHIO, U.S.A.



**EXPORT**

Willys-Export  
Corporation

Toledo, Ohio, U.S.A.

**EXPORT**

Willys-Overland  
Crossley, Ltd.

Stockport, England

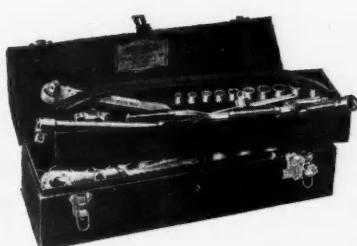
## WISE SERVICE MEN CHOOSE THEM to save time and effort



THE time lost on "fumbling" work—with wrenches not fitted to the job—is wasted profit. With the wide selection of parts in the New Williams' Socket Wrench Sets you can quickly "build up" the wrench that suits the individual job—exactly. Speed—ease—economy. And ready helpfulness that puts profits in the bank.

Williams' Detachable Socket Wrench line is complete. Midget—Bantam—Standard—Heavy Duty—Extra Heavy Duty Patterns for every variety of work. Sets of service helpers with a gumption for work. Thin socket walls make work easy in close quarters. Special alloy steel provides extra strength.

All Williams Sockets, Handles and Parts are finished in Chrome-plate—and are Guaranteed Against Breakage. Ask for literature.



WILLIAMS' SOCKET  
SET 55

This combination of "Standard" and "Heavy Duty" Socket Wrenches makes an ideal assortment for truck and bus work. Twenty-one Double Hex Sockets, fourteen handles and parts provide all desirable Socket Wrench combinations.

LIST PRICE—\$75.90  
(Liberal discount to user)

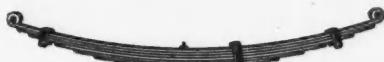
## WILLIAMS SUPERIOR DROP-FORGED TOOLS DETACHABLE SOCKET WRENCHES

J. H. WILLIAMS & CO.

"The Wrench People"

75 SPRING STREET, NEW YORK  
Buffalo Chicago

## Spring Makers for 38 Years



### SPRINGS FOR EVERY TYPE OF MOTOR VEHICLE

Automobile—Bus—Truck—Trailer

TRAINOR Springs are made from the highest quality spring steels—whether silico manganese, high carbon or chrome vanadium.

TRAINOR Springs are perfectly heat treated through the special Trainor Process—then rigorously tested and inspected by trained engineers.

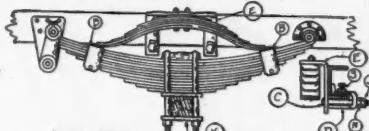
#### FORD BOOSTER SPRINGS



(For both 131½" and 157" wheel bases)

Eliminate sidesway and rebound, absorb shocks that would otherwise be damaging. Distribute equally excess weight on overhang. Additional load carried at correct place.

#### TRAINOR SAFE-T-SPRINGS



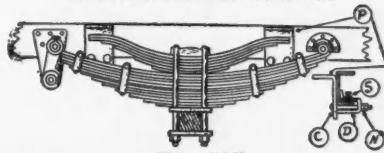
Pat No. 1702751

(For light duty trucks, 1-2 ton capacity)

A special truck Spring permitting extra payload and consequent profits on short and long hauls.

Easily installed. They eliminate sidesway, take up sudden jars and jolts that so often cause spring breakage and level the load.

#### TRAINOR HELPER SPRINGS



Type "A"

(For all types of trucks of 2 ton capacity and heavier)

An auxiliary truck spring designed to assist in handling heavy loads—level the load and eliminate side-sway. They are easy to install, with no holes to drill. Clamp on to the frame and will not come off.

The Trainor Line is the Profit Line

**TRAINOR**  
National Spring Co.  
Newcastle, Indiana

#### SEND COUPON TODAY

Trainor National Spring Co.

Newcastle, Ind.

Please send illustrated literature describing Trainor Springs.

Name .....

Address .....

City and State.....

# To Drive Safely



## YOU MUST SEE Clearly!

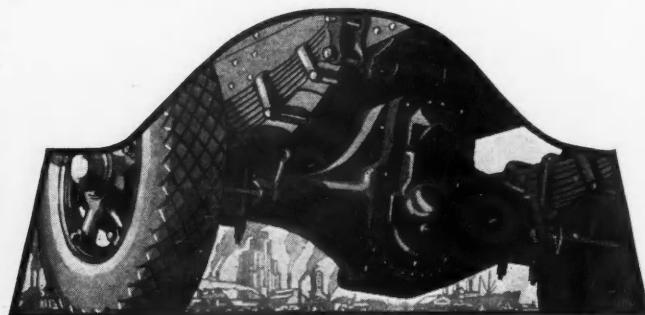
TO DRIVE safely, you must see clearly. In fair weather and in storm. . . . No dim little semi-circle of road or street can ever satisfy you, once you have looked out at THE WHOLE STORM-SWEPT TRAFFIC PICTURE, through crystal glass, cleaned and kept clean by the Handy Safety View Windshield Wiper. . . . For the first time, you are offered a Wiper that GOES THE FULL LIMIT in trustworthy, clear-vision safety. . . . Electrically powered, the Handy Safety View Windshield Wiper operates at steady speed, independent of the vehicle motor. Its twin blades wipe clear across. Its mechanism is built to outlast any vehicle on which it may be mounted. . . . Install it, and enjoy it. . . . Owners of truck, bus or taxi fleets, and individual motorists who admit NO COMPROMISE on any matter of SAFETY, welcome the Handy Safety View Windshield Wiper and are everywhere equipping with it. One model in lengths to fit any shield. List price, \$25. Ask us for full information—today. . . . Handy Safety View Windshield Wiper may be secured from Handy Governor Distributors everywhere.

HANDY CLEANER CORPORATION, SUBSIDIARY OF  
HANDY GOVERNOR CORPORATION  
3929 W. FORT STREET DETROIT, MICHIGAN



November, 1930

## When You Change to a Winter Lubricant Change to Dixon's 677



### The Double Film Lubricant For Differentials and Transmissions



No matter what the weather, how hard the going, these heavy duty parts will be constantly lubricated if you use Dixon's 677. Its two films—a film of graphite and a film of grease—flow freely in the coldest weather. No channeling . . . no stiff gear shifting . . . it clings to the gears keeping your trucks "on the go."

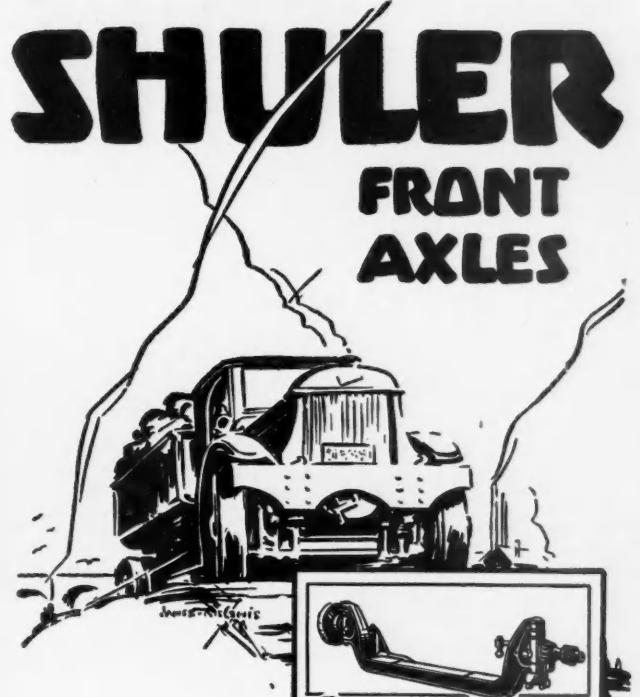
There's just one way to get this double protection—tell your dealer to use Dixon's 677. Fleet owners handling their own lubrication can buy Dixon's 677 in drums thru their dealers. Bulletin 122-G will be sent to interested dealers.

Joseph Dixon Crucible Co.  
Jersey City, New Jersey

**DIXON'S 677**  
Graphited Grease

The Commercial Car Journal

**SHULER**  
FRONT  
AXLES



*for* TRUCKS  
Tractors and Trailers

FUNCTION 100%

Shuler front axles function 100% regardless of rear axle construction.

The epitome of service is complete.

FRONT  
AXLES  
ONLY

**SHULER AXLE CO.**  
INCORPORATED  
LOUISVILLE KENTUCKY

**TITE FLEX**  
THE  
ALL METAL  
FLEXIBLE  
HOSE  
AND  
TUBING

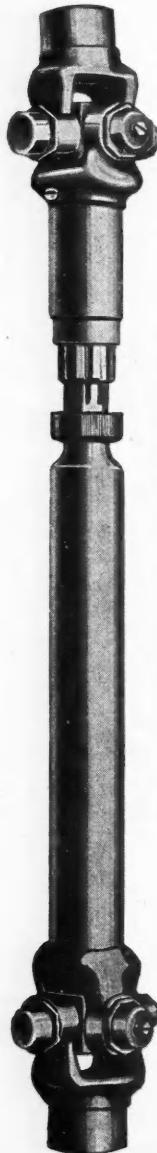
No truck or bus equipped with Titeflex has ever been tied up valuable hours on account of broken fuel lines. Road shock and vibration cannot break Titeflex all metal fuel hose.

The manufacturer who equips his product with Titeflex tubing is providing you with the best that money can purchase. He is making sure that your gas and oil lines never fail—because Titeflex lines don't break.

Write for catalog No. 109 describing Titeflex All Metal Flexible Hose and Tubing for automotive and industrial purposes.

**Titeflex**  
REG. U. S. PAT. OFF.

TITEFLEX METAL HOSE CO.  
Main Office and Factory  
500 Frelinghuysen Ave.  
NEWARK, N. J.



**M**aintenance under control pays a profit in long life and trouble-free performance. Maintenance out of control shows up in delayed shipments, displeased customers and Net Loss.

The Fleet Operator interested in getting the utmost in trouble-proof and durable universal joint performance will select Blood-Brothers Universal Joints as standard replacement for this important link in the power transmission system.

Years of wear will necessitate the replacement of but a few simple, inexpensive parts which Blood design makes it quick and easy to install.

## Trouble-Proof Performance

**BLOOD-BROTHERS  
MACHINE COMPANY  
ALLEGAN, MICH.**

November, 1930

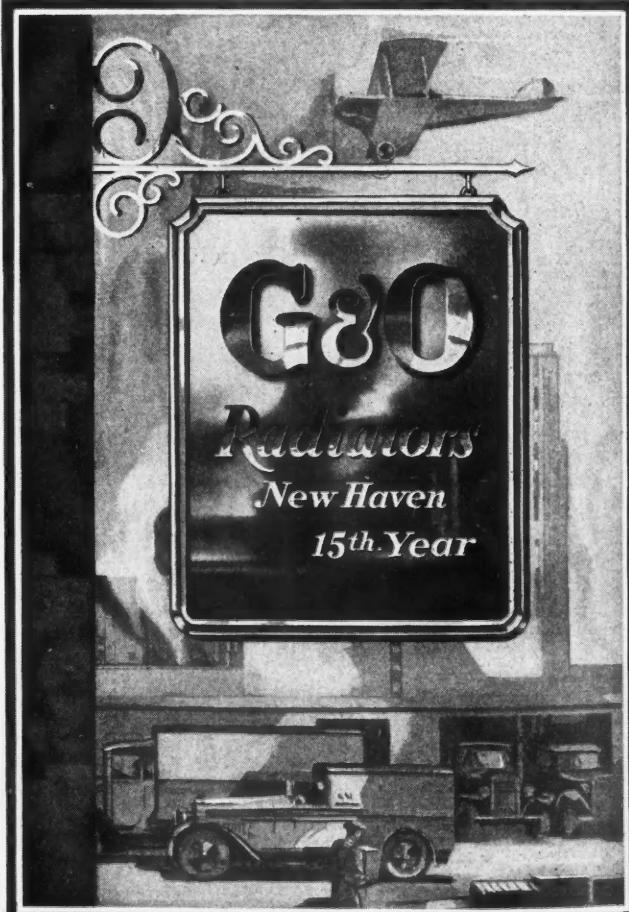
# BRUBAKER

## FOR MAXIMUM CUTTING TOOL EFFICIENCY

If your men service more than one make of truck—you'll find help in the Brubaker Handbook. Write for a free copy.

This efficiency begins when you buy Brubaker Tools . . . a complete line of reamers, taps, dies, valve reseaters and special cutting tools for all trucks and buses. Efficiency is increased and the life of the old tools is extended by Reconditioning performed by the Brubaker jobber. If you buy and take care of tools—Brubaker can save you money.

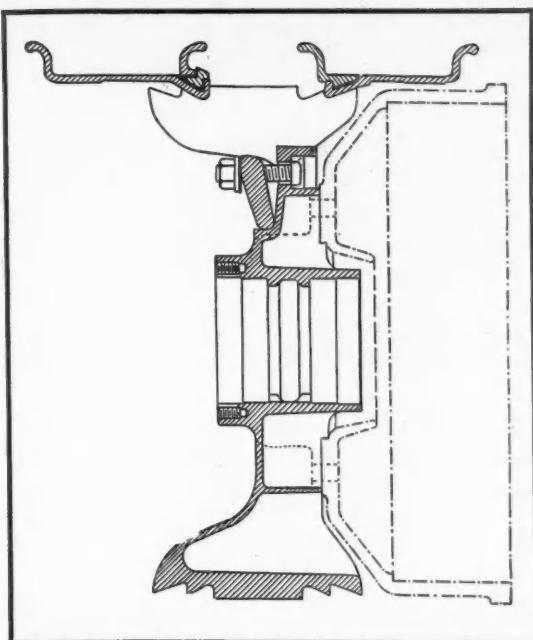
W. L. BRUBAKER & BROS. CO., Millersburg, Penna. Pacific Coast Representative Mechanics Supply Co.



The G & O Manufacturing Co., New Haven, Conn.

The Commercial Car Journal

# HOOPES WHEELS



Goodyear or Firestone  
Rims  
Interchangeable on  
Hoopes-Parker  
Dual Wheels

1867

Hoopes, Bro. & Darlington, Inc.  
WEST CHESTER, PA.

1930



Safeguarding  
Great American Names

For over 30 years B. C. A. Ball Bearings have justified the trust of the finest American Motor Car manufacturers. B. C. A. Annular and Thrust Bearings today are helping to safeguard the automotive industry of the future.



Bearings Company of America  
Lancaster, Pa.

Detroit, Mich. Office: 1012 Ford Bldg.

**FERODO**  
BRAKE LININGS

Used by the big-  
gest fleet operators  
of trucks and  
busses. There  
must be a reason.

**FERODO AND ASBESTOS INCORPORATED**

Manufacturers of Ferodo Bonded Asbestos Brake Lining in rolls, Ferodo Pat. Die-Pressed Brake Segments, Ferodo M-R Lining and Ferodo M-R Brake Blocks.

Factory and General Offices:  
New Brunswick, New Jersey



### UNBREAKABLE TAIL LAMP

**Unbreakable**—Made of rubber, bends instead of breaking.  
**Water Proof**—Rubber is the best insulation, also proof against water.

**Bright Light**—Due to special unbreakable lens.

**Vibration**—No effect on electric bulb because it is hung loose in lamp, is surrounded by rubber and cushioned by a light spring.

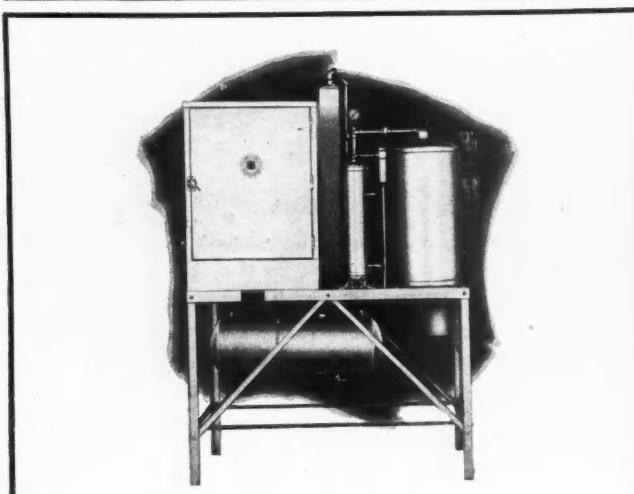
**Guaranteed**—Unbreakable. **Price \$5.00**

### BULL TAIL LAMP

PATENTED

CHAMPION RUBBER LAMP CO., INC., 236 W. 55th, New York City

Special attention of *Oil Companies* and  
*Electric Light and Power Companies* is  
called to this **INSULATED** tail lamp.



### Truck Fleet Operators!

For best truck lubrication  
at  
lowest operating cost

use  
**SKINNER OIL RECLAIMER**

— Now Over 300 Satisfied Users —

**SKINNER MOTORS, INC.**  
Detroit, Michigan



### « « THE TOOLS » » OF TRUCK MANAGEMENT

This man is in control of 12 motor trucks. Notice the twelve charts on the wall. Each chart tells the story of a truck for 24 hours—all the delays, all the running time. ¶ Last week's or last month's charts he keeps on a spindle or in a vertical file. ¶ To "add up" the running time on these charts

the manager is supplied with a "totaler"—as shown in his hands. ¶ On the desk is the well known *Servis Time Record Book*, (now in its 8th edition) in which he enters results in graphic form—a "picture book" of truck performance. ¶ Write for "Sample Pages" of it.

**THE  
SERVIS  
RECORDER**  
"Keeps Trucks Busy"

**THE SERVICE RECORDER CO., Cleveland, O.**



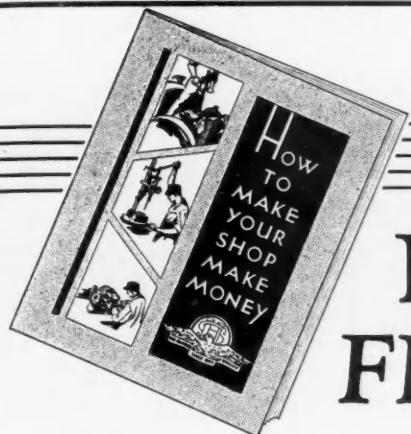
**TETCO  
T.I.M.**

### You Can't Pay Dividends— WITH EXCUSES

The only answer the "boss" is interested in is results. You can't alibi profits. It's up to you to know which units are paying their way—which units are black sheep. TETCO T.I.M. will supply you truthfully and accurately with all the information you need on the activity of your trucks. TETCO T.I.M. separates the non-paying units from the profit units. You need TETCO T.I.M.

TETCO T.I.M. is the most efficient, useful and economical time recorder on the market. This Seven-Day Recorder with a year's supply of charts—\$40.00. Write for quantity discount. Distributors write for proposition.

**The Electric Tachometer Corporation**  
Broad and Spring Garden Sts.  
Philadelphia Penna.

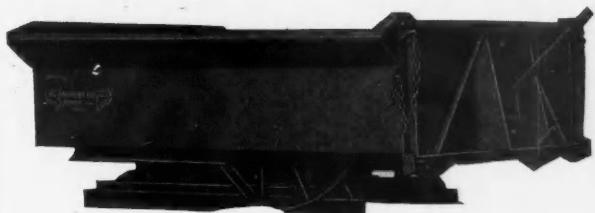


## It's FREE

How much would you pay for one idea that would lower the operating cost of your trucks? This U. S. book is full of such ideas, each a practical, helpful suggestion on operating your shop on a more profitable basis. And it's free for the asking. You'll naturally want to use U. S. tools to put these labor saving ideas into effect. Ask for a catalog when you ask for the book.



UNITED STATES  
ELECTRICAL TOOL CO.  
2455 W. 6th St.  
Cincinnati, Ohio



### ANTHONY COAL BODIES

Coal Dealers appreciate the dependability of Anthony Bodies. Complete line of Anthony Bodies to meet your Coal Dealers' requirements.

Rotating Power Hoist  
Hydraulic Hoist  
Hand Hoist  
Stationary.

*Write for Catalogues.*



NATIONAL DISTRIBUTION



### REMEMBER—

FLEX-O-TUBE, the non-breakable, leak-proof gas and oil feed line is your guarantee against delays and loss due to fuel line breakage. All lines are equipped with our famous one-piece, solderless couplings.

Use FLEX-O-TUBE to stop vibration at these vital points:

- 1 Between gas tank and vacuum tank.
- 2 Between vacuum tank and carburetor.
- 3 Between intake manifold and vacuum tank.
- 4 Between crankcase and gauge on dash.
- 5 As a grease tube leading to the clutch throw-out release bearing.

Ford Dealers will be interested to learn we make a Flexible Gas Feed Line instantly interchangeable with Model "A" metal line. Prices on request.

FLEX-O-TUBE is available in any size and for any pressure. Ask for descriptive booklet.

FLEXO TUBE CO.  
2424 Pine St.  
DETROIT, MICH.

*One piece  
solderless  
couplings*

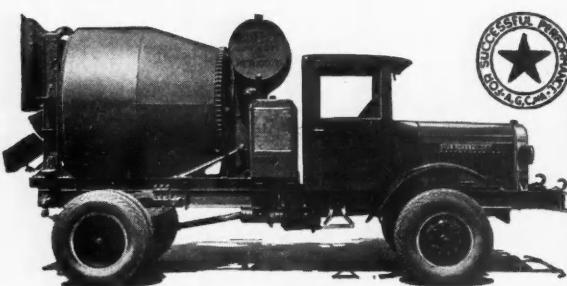


Approval by critical representative buyers vouches for the high standard of ATTERBURY quality . . .

### ATTERBURY Motor Car Company

Established 1903

Elmwood Ave. at Hertel, Buffalo, N.Y.



## Ready-Mixed Concrete

THE Hug Roadbuilder is recognized as an outstanding transportation unit for the transportation of ready-mixed concrete. Large central mixing plant operators recognize the superior advantages of the Hug Roadbuilder for this type of work and today large fleets of Hugs are delivering ready-mixed concrete on schedule time, and at a profit to the operator. Here again the Hug Roadbuilder, due to its specialized and sturdy design, has gained an enviable reputation for profitable transportation.

Hug Roadbuilder Trucks can be furnished with special Hug Bodies for transporting ready-mixed concrete or special chassis can be furnished to meet the individual specifications of various types of mixed in transit bodies.

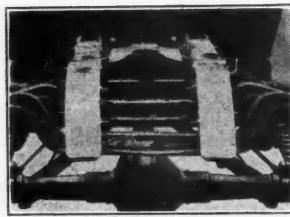
The Hug Roadbuilder and Commercial Line offers unlimited sales possibilities for responsible distributor. Complete information furnished on request.

# HUG

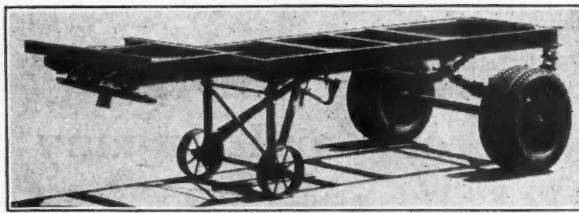
THE HUG COMPANY, Highland, Illinois

## New "Dispatch" . . . is Here

This new DISPATCH model—in both Lapeer and Trailmobile types—makes possible lower cost haulage with light tractors as the larger Lapeers and Trailmobiles already do with heavy tractors. With the new DISPATCH, dealers can now sell lowest cost trailerized transportation to users of 1½ ton tractors—increase sales—make extra profits. The new DISPATCH can be sold at an amazingly attractive price. Wire for details. The Trailmobile Co., General Sales Offices, Oakley, Cincinnati, Ohio.



1½-ton tractor equipped with Trailmobile Fifth Wheel



DISPATCH chassis—Trailmobile Type

**LAPEER AND Trailmobile**

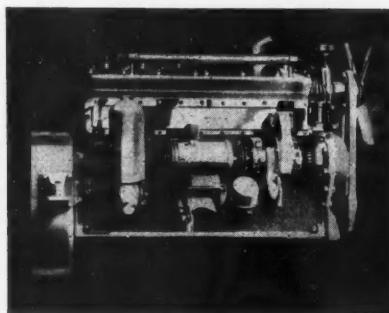
TRADE MARK REG. U. S. PAT. OFF.

## BUDA "HIVELO" SERIES

Buda Engines Hivelo Series . . . fours and sixes . . . are engineered to take a position of leadership in this day of high duty rapid transportation.

High Velocity Cooling . . . High Velocity Lubrication . . . High Velocity Combustion.

Specifications upon request.



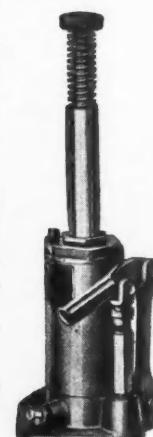
THE BUDA COMPANY  
Chicago Suburb  
HARVEY, ILLINOIS

## Trucks Deliver More Tonnage with This Jack!

TRUCKS never come too big for Blackhawk one-hand lift. Heavy or light, loaded or not—it's all the same to a Blackhawk Hydraulic. This tremendously powerful, modern jack lifts load and all by one-hand pressure, and lowers automatically. Saves time and work.

That's why these time-saving jacks are standard on the leading heavy trucks, and truck fleets. See your dealer. Write for proof of Blackhawk advantages.

BLACKHAWK MFG. CO.  
Dept. CO, Milwaukee, Wis.



## BLACKHAWK HYDRAULIC JACKS

SPECIALLY  
DESIGNED FOR  
HEAVY DUTY  
SERVICE



**ViCTOR**  
MADE IN U.S.A.  
GASKETS

VICTOR MFG. & GASKET CO.  
5750 Roosevelt Road ... Chicago  
WORLD'S LARGEST GASKET MANUFACTURER

## This Book is Free from "PUFF-STUFF"

DID you receive your copy of our new book on "Engineered Transportation?"

The Vice-President of a prominent Motor Truck factory writes us: "I congratulate you on the excellence of this book. It is conspicuous by the absence of generalities and puff-stuff. The tables and figures given are valuable, and as far as we have been able to check them, accurate."

This pocket-size volume is a textbook on modern haulage costs—and you'll be glad to keep it for ready reference. Write for it—no obligation!

*Oldest and Largest Manufacturers  
of Trailers*

**FRUEHAUF TRAILER COMPANY**  
Branches and Distributors in All Principal Cities  
10957 Harper Avenue Detroit, Michigan

## INCREASE SALES VOLUME SECURE REPEAT ORDERS

A progressive dealer is not only attracted by a handsome profit to sell dump body equipment, but also by the minimum amount of servicing to keep the bodies on the job. Often an enticing margin is completely consumed by service charges. Consequently, this is not so profitable.

Galion Allsteel Dump Bodies are beyond the experimental stages. They serve efficiently and indefinitely. Sell them to your customers—repeat orders will follow. Get the facts for your 1930 program.

WRITE FOR FACTS

THE GALION ALLSTEEL BODY CO.  
Box 5, GALION, OHIO

## GALION ALLSTEEL BODIES





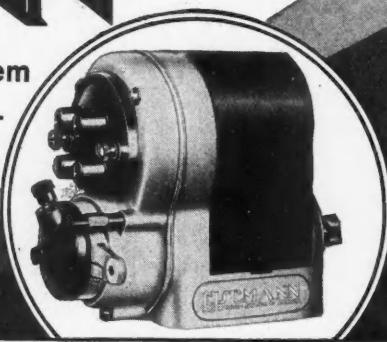
**When you apply the mathematics  
of value, Mather Springs are the  
logical choice.**

**THE MATHER SPRING COMPANY, TOLEDO, OHIO**

*Manufacturers of Scientifically Heat Treated Automobile Springs*

**EISEMANN**

An Efficient, Reliable Ignition System  
—independent of storage battery—  
for MOTOR TRUCKS  
and BUSES



EISEMANN MAGNETO CORPORATION—60 E. 42nd Street—NEW YORK

THE NEW EVEREADY PRESTONE  
• green in color •

We welcome the opportunity to co-operate  
with the industry in field or laboratory tests.

NATIONAL CARBON COMPANY, INC.

General Offices: New York, N. Y.

Branches: Chicago Kansas City New York San Francisco

Unit of Union Carbide UCC and Carbon Corporation

**Commercial Car Journal Truck Specifications  
ARE CORRECTED  
MONTHLY**



You can depend on the information they contain as being  
accurate and up-to-the-minute. Use them to sell and use  
them to service.



## THESE PARTS LAST

Logan Gears usually outlast the car—even cars subjected to the frequent starting and the terrific strains of commercial use. If you could dispose of every other replacement as economically, quickly and permanently service would soon cease to be an appreciable trouble or expense. Logan Gears made exactly to car specifications are obtainable for all commercial cars. Ask the leading distributor in your market.

THE LOGAN GEAR COMPANY  
Toledo, Ohio

Warehouses in:  
Brooklyn, N. Y., Dallas, Texas, San Francisco and Los Angeles, Calif., Kansas City, Mo.

Blocking and finishing machines in the ring and pinion gear department of The Logan Gear Company's great modern plant.



Logan fly-wheel gears represent the highest standards in quality and accuracy. Catalog B.



Logan Mated Ring and Pinion Gears are accurately cut and perfectly mated. Catalog A.

## MORE POWER FOR WINTER PULLS

### The SCHACHT De Luxe Series

Every model in the SCHACHT DeLuxe Series is powered, designed, and constructed for all-year better service. SCHACHT dependability prevents slowing up on the job when the weather's bad. The SCHACHT franchise offers dealers a complete line of modern, fast selling motor trucks, priced to give super-value. Write or wire for details.

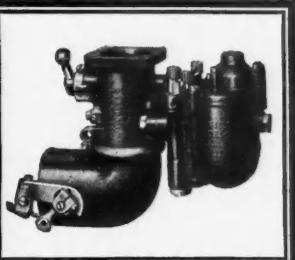
The LeBlond-Schacht Truck Company  
8th and Evans Streets, Cincinnati, Ohio  
Successful Truck Manufacturers for over 20 Years



## Logan Gears

**Logan Gears**  
MATED RING GEAR and PINION

"SHRUNK ON"  
**LOGANGEARS**  
FOR FLY WHEEL REPLACEMENT



## WINFIELD CARBURETORS *will save you money*

FLEET OWNERS have found that a Winfield Carburetor positively does increase the gas mileage. The saving in gas will make this carburetor a profitable investment. It quickly pays for itself.

\* A Winfield also delivers increased power...makes the motor run smoother...does not load up...starts easier...idles better...and does not dilute the oil.

\* Get the facts on what this carburetor can do for you. You have nothing to lose and much to gain.

**WINFIELD CARBURETOR CO., Ltd.**

1900 E. Jefferson Avenue  
DETROIT, MICH.

3053 Treadwell Street  
LOS ANGELES, CALIF.

## There's no Cab like the **HIGHLAND COUPE CAB**

Trim appearance . . . utmost comfort for the driver . . . sturdy construction that assures years of dependable service . . . Rocker Sill Mounting and other exclusive features . . . all these are advantages that make HIGHLAND the outstanding leader in the Truck Cab Field.

Whether selling new trucks and tractors or reconditioned old equipment, it will pay you to get HIGHLAND details, specifications and prices. Write—no obligation.

**THE HIGHLAND BODY MFG. CO.**  
403 Elmwood Place  
Cincinnati, Ohio

# ADVERTISERS' INDEX

## A

Accuralite Co.	103
Acme White Lead & Color Works (Proxlin Division)	81, 82
Albertson & Co., Inc.	104
Aluminum Co. of America	83
American Brake Materials Corp. (Automotive Division of American Brake Shoe & Foundry Co.)	100
American Cable Co., Inc.	94
Anthony Co., Inc.	131
Atterbury Motor Car Co.	131
Autocar Co.	112

## B

Bearings Co. of America	129
Bendix Brake Co. (Division of Bendix Aviation Corp.)	2
Bendix-Westinghouse Automotive Air Brake Co.	98
Blackhawk Mfg. Co.	132
Blood-Brothers Machine Co.	128
Bosch Magneto Co., Inc., Robert	5
Bragg-Kliesrath Corp.	84
Brockway Motor Truck Corp., Second Cover	
Brown-Lipe Gear Co.	96-111
Brubaker, W. L. & Bros.	128
Buda Co., The	132
Budd Wheel Co.	123

## C

Champion Rubber Lamp Co., Inc.	130
Chevrolet Motor Co.	17
Cleveland Pneumatic Tool Co.	58
Curtis Pneumatic Machinery Co.	102

## D

Dayton Steel Foundry Co.	113
Dixon Crucible Co., Joseph	126
Dodge Brothers	Front Cover
Durwyllan Co.	3

## E

Eisemann Magneto Corp.	134
Electric Tachometer Corp.	130
Elite Mfg. Co.	99

## F

Federal-Mogul Corp.	124
Federal Motor Truck Co., Back Cover	
Ferodo & Asbestos, Inc.	129
Firestone Steel Products Co.	97
Flexo Tube Co.	131
Four Wheel Drive Auto Co.	101
Fruehauf Trailer Co.	133
Fuller & Sons Mfg. Co.	4

## G

G & O Manufacturing Co.	128
Galion Allsteel Body Co.	133
General Tire & Rubber Co.	85
Good Roads Machinery Co., Inc.	117
Goodyear Tire & Rubber Co.	53
Gramm Motors, Inc.	124
Gunite Corp.	89

## H

Handy Governor Corp.	126
Heil, The, Co.	105
Hercules Motor Corp.	116
Highland Body Mfg. Co.	135
Hoopes, Bro. & Darlington, Inc.	129

Hug Co.	132
Hunt-Spiller Mfg. Corp.	56, 57
Hyatt Roller Bearing Co.	1
Hydraulic Brake Co.	51

## I

International Harvester Co. of America, Inc.	12
International Nickel Co., Inc.	106

## K

Keasbey & Mattison Co.	115
Kentucky Wagon Mfg. Co.	122

## L

La France-Republic Corp.	55
LeBlond-Schacht Truck Co.	135
Leece-Neville Co.	107
Logan Gear Co.	135
Long Mfg. Co.	7
Lycoming Manufacturing Co.	114

## M

Mather Spring Co.	134
Motor Wheel Corp.	Third Cover

## N

National Carbon Co., Inc.	134
---------------------------	-----

## P

Parish Pressed Steel Co.	96-111
Piston Ring Co.	109

## R

Relay Motors Corp.	61-62-63-64
Reo Motor Car Co.	121

## S

Schrader's, A. Son, Inc.	88
Service Recorder Co.	130
Shuler Axle Co., Inc.	127
Silver King Hydraulic Jack Co.	120
Skinner Motors, Inc.	130
Spicer Mfg. Corp.	96, 111
St. Paul Hydraulic Hoist Co.	92
Standard Motor Truck Co.	122
Standard Pressed Steel Co.	138
Stewart Motor Corp.	118
Studebaker Corporation of America	108

## T

Timken-Detroit Axle Co.	95
Timken Roller Bearing Co.	9
Titeflex Metal Hose Co.	127
Trailmobile Co.	132
Trainor National Spring Co.	125

## U

Unit Corporation of America	4
United States Asbestos Division of Raybestos-Manhattan, Inc.	10, 11
United States Electrical Tool Co.	131

## V

Veeder-Root, Inc.	133
Vickers Mfg. Co.	59
Victor Mfg. & Gasket Co.	133
Visco-Meter Corp.	6

## W

Waukesha Motor Co.	86-87
Weaver Manufacturing Co.	90, 91
White, The, Co.	93
Willard Storage Battery Co.	119
Williams, J. H. & Co.	125
Winfield Carburetor Co., Ltd.	135
Wisconsin Axle Co.	8
Wood Hydraulic Hoist & Body Co.	110

## Z

Zenith-Detroit Corp.	137
----------------------	-----

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF COMMERCIAL CAR JOURNAL and OPERATION & MAINTENANCE published monthly at Philadelphia, Pa., for October 1, 1930

### STATE OF PENNSYLVANIA } COUNTY OF PHILADELPHIA }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared A. W. Brownell, who, having been duly sworn according to law, deposes and says that he is the Business Manager of COMMERCIAL CAR JOURNAL and OPERATION & MAINTENANCE, and that the following is to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publishers, editor, managing editor, and business manager are: Publisher, Chilton Class Journal Company, 56th & Chestnut Sts., Philadelphia, Pa.; Editor, George T. Hook, 30 Rockhill Rd., Cynwyd, Pa.; Directing Editor, Norman G. Shidle, Walnut Plaza, 63rd & Walnut Sts., Philadelphia, Pa.; Business Manager A. W. Brownell, 508 Anthwyn Rd., Merion, Pa.

2. That the owners are (Give names and addresses of individual owners or if a corporation, give its name and names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock) United Publishers Corporation, 239 West 39th St., New York City.

United Publishers Corp. Stockholders in excess of 1%

A. United Business Publishers, Inc., 239 W. 39th St., N. Y. C. (see note)  
B. Frederic C. Stevens Co., 23 Prospect Terrace, Montclair, N. J. (see note)

Note—Stockholders of (A) in excess of 1%

UNITED BUSINESS PUBLISHERS, Inc.  
C. S. Baur, Flushing, L. I., N. Y.  
George H. Buzby, Wellington Apts., 19th & Walnut Sts., Philadelphia, Pa.  
Anna B. Frank, Pleasantville, N. Y.  
Fritz J. Frank, Pleasantville, N. Y.  
Lee, Higginson & Co. (Partnership), New York, N. Y.  
C. A. Musselman, Merion, Pa.  
A. C. Pearson, Montclair, N. J.  
Lelia C. Pearson, Montclair, N. J.  
Frederic C. Stevens, 325 West End Ave., New York, N. Y.  
Frederic C. Stevens Co., 23 Prospect Terrace, Montclair, N. J.

Stockholders of (B)

FREDERIC C. STEVENS CO.  
Velma I. Stevens, 325 West End Ave., New York, N. Y.  
F. C. Stevens, Jr., 325 West End Ave., New York, N. Y.  
Velma S. Stevens, 325 West End Ave., New York, N. Y.  
Frederic C. Stevens, 325 West End Ave., New York, N. Y.  
Ruth S. Kane, Montclair, N. J.

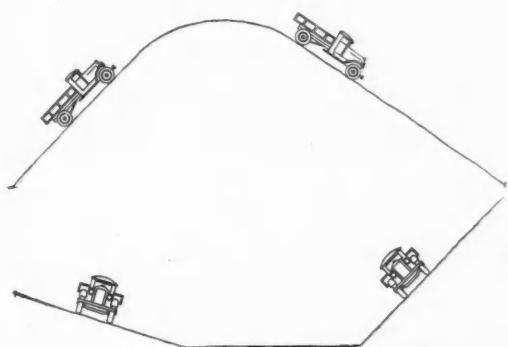
3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

A. W. BROWNELL, Business Manager.  
Sworn to and subscribed before me this 1st day of October, 1930.

(Seal) JOHN A. CLEMENTS.  
My Commission expires at the end of the next session of the Senate.

# Giving your trucks their greatest range of usefulness



One of the many valuable features that mark the Zenith Universal as the greatest improvement in carburetion in recent years is its ability to function perfectly at great angles.

Where the ordinary carburetor functions normally up to a 12% grade, using the Zenith Universal trucks can work up to the angle where traction is lost—and the carburetor continues to operate as efficiently as it does on the level.

You will readily see how the range of usefulness is increased with such a remarkable carburetor. In excavations, ramps, tipping platforms and in hilly country grades of 20% or even more are encountered. Where the truck equipped with a common carburetor must stop—that equipped with the Zenith Universal goes right on.

The Zenith Universal embodies many other features necessary for efficient operation of trucks and buses: Its automatic accelerating and economizing features insure maximum power when needed and marked economy of operation; it is fully balanced so that efficient air-cleaning devices can be fitted without danger of crankcase dilution; its spring loaded strangler insures easy starting, continued running in the coldest weather; its stainless steel parts insure long life and no corrosion; its heavy construction makes it durable under the hardest conditions of use; it is easy to clean and service; it can be supplied with or without an adjustment; it is sold at an attractive price.

The full details of the Zenith Universal's new standard of carburetor efficiency and economy will be sent to you on request.

## ZENITH-DETROIT CORPORATION

*Manufacturers of Zenith Carburetors and Filters*

**DETROIT**

*Member Motor Truck Industries, Inc., of America*

**MICHIGAN**

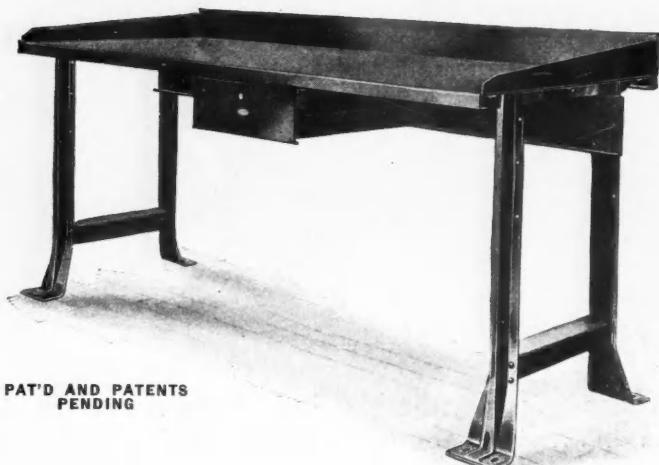
**NEW YORK**

**CLEVELAND**

**CHICAGO**

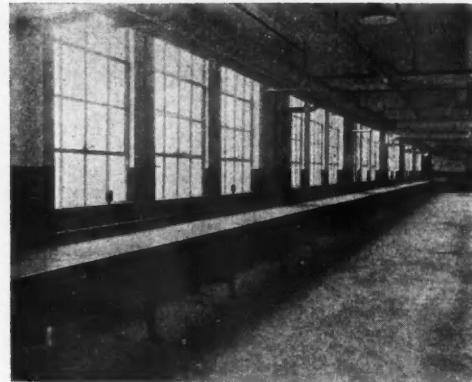
**MILWAUKEE**

# “HALLOWELL” Ready-Made Steel Shop Equipment



PAT'D AND PATENTS  
PENDING

Fig. 736—General View of the “HALLOWELL” Work-Bench of Steel, with Back Board, End Pieces, etc. Standard sizes carried in stock.



This Bench was set up in one of the largest truck service stations in the country—later was dismantled and set up as individual benches throughout the shop—try to do this with a wooden bench—all that's left is a pile of kindling wood.

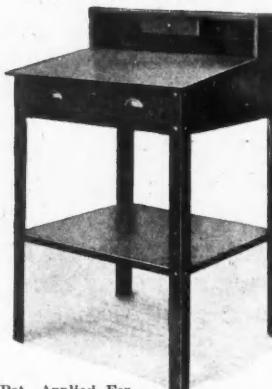
## BUY—Stop Carpentry



Fig. 705—“HALLOWELL” Tool Stand of Steel. With or without casters. Very handy around machine shops, service stations, garages, etc. Carried in stock. Get Bulletin 386.



Fig. 919—“HALLOWELL” Stool of Steel. Just the thing when tired standing up. Carried in stock. Get Form 419.



Pat. Applied For  
Fig. 981—“HALLOWELL” Foreman's Desk of Steel. Fine for standing up to work at. It is fireproof; therefore a safe place to keep records in drawer under lock and key. Get Form 416.

“HALLOWELL” Steel Shop Equipment is made in 1368 different sizes, styles and combinations.

(Bulletins 386-416-419—yours for the asking.)

**STANDARD PRESSED STEEL CO.**

BRANCHES  
BOSTON  
CHICAGO  
DETROIT

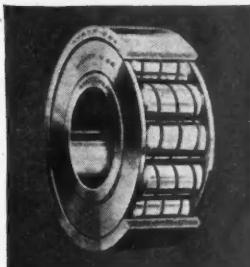
JENKINTOWN, PENNA.

BOX 22

BRANCHES  
NEW YORK  
SAN FRANCISCO  
ST. LOUIS



## Fleet owners approve the outstanding performance of the new Federal with a steady flow of orders



THE new dominant model D Federal employs Hyatt Quiet Roller Bearings at important positions in the chassis.

In its companion models also, Hyatts reflect the care the builders exercise to match quality products and good equipment.

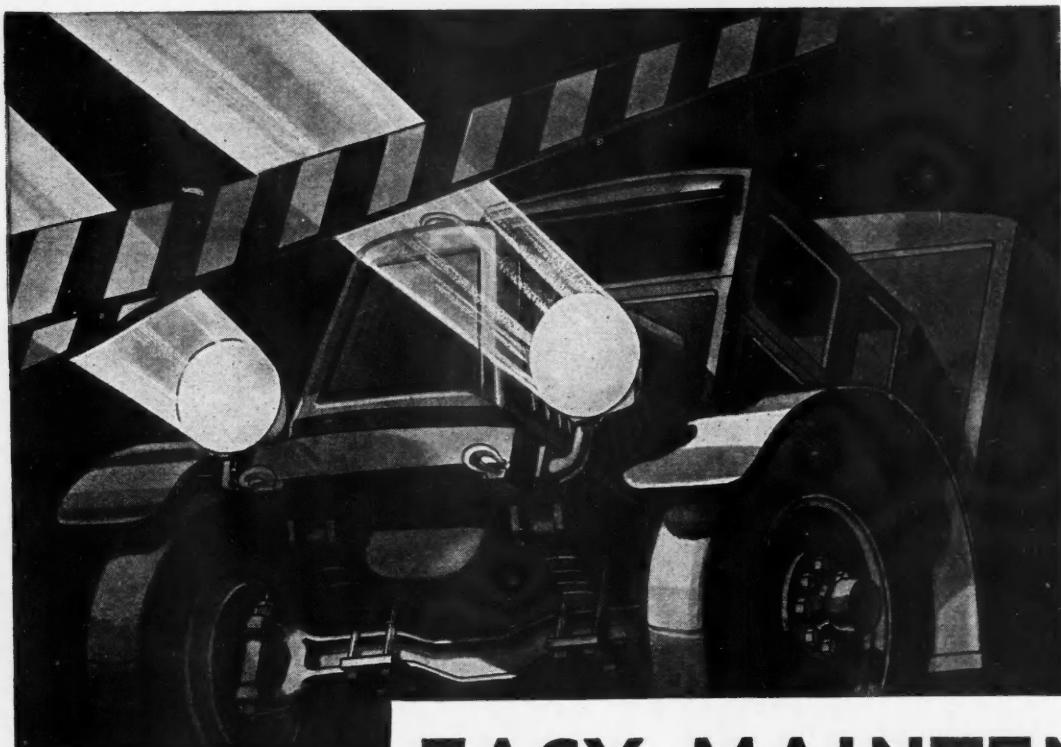
Long life...endurance...freedom from service or adjustment are fortified with sturdy Hyatts...dependable Hyatts over interminable miles.

The fact that Federal has been a consistent user of Hyatts for 16 years is in itself an indication of operating satisfaction.

HYATT ROLLER BEARING COMPANY  
Newark   Detroit   Chicago   Pittsburgh   Oakland

**HYATT**  
QUIET ROLLER BEARINGS

PROTECTING QUALITY PRODUCTS



## EASY MAINTENANCE CUTS COSTS

The more closely you study truck and bus brakes the more definitely do Bendix Brakes stand out as money-savers.

For example, Bendix Brakes appear in a class by themselves for easy, low cost maintenance.

Consider these facts:

Replaceable shoes—Bendix Brakes have put the old-fashioned relining equipment out of business; just remove shoes with worn lining, and put in new ones; easy, and minimum "time-out" for the truck.

Tightly enclosed brake assem-

bly—full and effective protection against those enemies of brake efficiency—dust, water, mud.

Back of these excellent service features is Bendix Servo action; using the vehicle's momentum for quick stopping, multiplying easy pedal pressure into a powerful braking force; sparing the driver, making quicker stops *safe*—and desirable.

Good idea—worth money: *study brakes.*

BENDIX BRAKE CO., South Bend, Ind.

{Division of Bendix Aviation Corporation}

**BENDIX**  **BRAKES**  
**FOR SAFETY**

Bendix Mechanical 4-Wheel Brakes • Lockheed Hydraulic Brakes • Bendix-Westinghouse Automotive Air Brakes  
B-K Vacuum Brake Boosters